The Alberta Journal of Educational Research

Vol. VI, No. 3 *September, 1960*

THE COMMITTEE ON EDUCATIONAL RESEARCH
Faculty of Education
University of Alberta

ACKNOWLEDGMENT

This publication was made possible by funds granted by the Carnegie Corporation of New York. The Corporation is not, however, the author, owner, publisher, or proprietor of this publication, and it is not to be understood as approving by virtue of its grant any of the statements made or views expressed therein.

THE WORK OF PIAGET AS IT RELATES TO SCHOOL MATHEMATICS

D. H. Crawford
Faculty of Education
University of Alberta

Introduction

The study of intellectual development of the child has always been and always will be of importance to teachers. One man has made this study his life work, and over a period of some 40 years has patiently observed, recorded, tested, reflected, and as a result has produced, together with his collaborators, a voluminous output of books and papers outlining his views of how concepts such as number, space and logical reasoning develop.

The name of this man is Jean Piaget, a Swiss psychologist, who has been called "the scientist who has explored the mind of the child as Galileo explored the sky." Yet it is only recently that his true genius has been acknowledged.

Before proceeding to an account of Piaget's findings, and their relevance to the teaching of mathematics, I wish to say a few words about his methods of investigation.

He began as others have by keeping careful records of what young children of different ages actually said or did, but soon discovered that this approach was by no means sufficient, and so he came increasingly to make use of specially devised testing situations in which he studied behaviour. In this way, the emphasis in his work has shifted from the *words* of the child to his *actions* with objects, although the verbal responses of the children have still been a major source on which his conclusions have been based.

Another major point should be noted here also. Essentially his studies have been *qualitative* rather than *quantitative,* and he has paid little attention to principles of statistical design such as sampling and reliability. In some experiments he uses his own three children, who could hardly be called representative, while in others he seems to have used a large part of the school population of Geneva.

Piaget's Concepts and Findings

Basic Concepts

Let us move on to take a closer look at Piaget's work in the areas in which we are most interested—the concepts of number, space and logical reasoning.

He starts from the biological concept of *adaptation,* which he sees

as the interplay of two complementary processes, called *assimilation* and *accommodation.* Assimilation occurs when an organism uses something in its environment for some activity which is already part of its repertoire, while accommodation involves the addition to its repertoire of new activities or the modification of old activities in response to the impact of environmental events. As the child's development proceeds, a more and more complete balance and synthesis between assimilation and accommodation is achieved.

Piaget believes that thinking has its origins in actions physically performed, and that its more developed forms arise when these actions are "internalised" into organized systems. Thus he sees the development of intelligence as a process of active construction whereby the instruments of thought are formed.

The central idea is that *the internalised actions or operations which compose these systems are reversible.* He contrasts this property of logical or operational thought—its reversibility—with the fact that in his early years the child is dominated by perception, which is essentially irreversible in nature, for an individual can only perceive a given visual scene from one point of view at a time.

A simple example will help to illustrate what he means by this reversibility. Five multiplied by four gives twenty; twenty divided by four gives five. This seems trivial to us, but the young child who "knows" that five times four equals twenty, in the sense at least that he can repeat the words, does not necessarily know that twenty divided by four equals five. In fact, he is not thinking operationally unless he sees that he can *deduce* the second result from the first. When the child does see that the second is implied by the first, and other relationships, such as the connection between five times four equals twenty and ten times two equals twenty, follow. Piaget would say that he has constructed for himself a group of operations.

Furthermore, Piaget believes that a sure sign of the child's having constructed such a group is the presence of what he calls a "principle of conservation." When actions form a group, there is always some constancy, something which remains invariant throughout the transformations to which the actions give rise. Thus when thinking is operational, different arrangements and sub-divisions of a whole do not destroy it. According to Piaget, the presence or absence of this principle tells him how well the thought of his subject has been structured in its handling of the issues in question. If the principle is not invoked, he wants to know what other modes of reasoning are employed, i.e. what the pre-operational arguments are.

He also makes the hypothesis that "the construction of number goes hand in hand with the development of logic." He goes on to

say his results show this and concludes that "logical and arithmetical operations therefore constitute a single system that is psychologically natural, the second resulting from generalisation and fusion of the first."

I shall now give a brief outline of the stages of intellectual growth as defined by Piaget, and rely on the illustrations I provide to demonstrate the close connection which he maintains exists between numerical and logical concepts. I will follow this with a brief discussion of the development of spatial concepts.

Stages of Intellectual Growth

In the *Psychology of Intelligence,* he defines three general levels of intellectual growth, with certain sub-levels, giving approximate age-levels in each case. These are

Level I	Non-Operational	(Birth-2 years)
Level II	Pre-Operational	(a) Transduction (2-4 years)
		(b) Intuitive (4-7 years)
Level III	Operational	(a) Concrete (7-11 years)
		(b) Formal (11 years and over)

We shall be primarily concerned with the second and third levels, covering ages 4 upwards, but I shall outline the first stage briefly for completeness.

Stage I (Non-Operational, 0-2 years)

This he also calls the sensori-motor period. It consists chiefly of simple hereditary reflexes, refined and supplemented by habits learned through trial and error. During it, the child is solely concerned with objects as objects. Thus if a ball is temporarily hidden from the baby, for him it ceases to exist. He does not yet have the power to construct a symbol for the ball, i.e. he lacks the concept "ball" which is bound up with objective notions of space, time and causality, notions which he had to build up gradually through interaction with the world.

Stage II (a) (Pre-Operational—Transductive, 2-4 years)

The achievements of Stage I are now dwarfed by the prospects introduced by signs and symbols, particularly words and images. These expose him to a world which extends far beyond his momentary range of vision or even his life-span — a stable and consistent world compared to the changing world of perception he has previously known. The tendency to imitate sounds, etc., found in Stage I increases in range, and reaches its climax with "deferred imitation" when it imitates the behaviour of an absent person of whom the child is reminded. Memory thus becomes possible, as the abstraction from action to thought is made. At the same time, with

the development of language, objects are symbolised by a thought process which can be retained in the mind. However, there is no distinction as yet between the general and the particular which is an essential part of true concepts. On a walk through the woods, for example, the child does not know whether he sees a succession of different snails, or whether the same snail keeps re-appearing. Such a distinction means nothing to him. They are all "snail" to him. He is using what Piaget calls a pre-concept.

Stage II (b) (Intuitive, 4-7 years)

We now come to the first stage in which we are particularly interested—the intuitive period, covering the period 4-7 years according to Piaget. We can gain a good idea of the sub-stages of development from considering the following experiment. Some red and green beads of equal size are given to the child, who then places them in two small glasses A_1 and A_2, identical in shape and size. The child is then told to put a red bead into A_1 with her right hand every time she puts a green one into A_2 with her left hand. After a moment, she is stopped and asked *Have you got the same amount in the two glasses? — Yes.* The beads in A_1 are now poured into glass B, which is taller and thinner than A_1 and A_2 *Are they* (A_1 and B) *the same? — No. less there* (B) *and more there* (A_1) — Why? — Because you poured them into a little glass. The fact that glass B is taller and thinner leads the child to reason that there are fewer beads in B. Other children taking part in the same experiment will say that there are *more* beads in B because it is *higher.* Even though some children count the beads (about six are used) they cannot conserve the idea of six. A slightly more advanced child begins to have doubts, and makes a statement like "There must be more because it's higher, but it's thinner too." Eventually, the child realizes that height and cross-section must be considered at the same time in judging how many beads there are, and realizes that the number of beads remains unaffected by their spatial arrangement. He is then thinking operationally. These three sub-stages take place according to Piaget, at the ages of 5, 5½-6, 6½-8 years approximately. He calls the first sub-stage the stage of global comparisons, and regards it as the starting point from which the concept of quality, measure, series and number finally evolve.

Piaget found the same three stages when he investigated the way in which children would set about matching a set of glasses with one of bottles. At the first stage the child was unable to achieve equivalence because he did not match each glass to a bottle, i.e. he did not make a one-to-one correspondence. At the second stage the child can make a correspondence spontaneously, but the correspondence is still governed by perception for it fails to persist

when the elements involved are disarranged in some way. Finally by 6½ years or so, lasting equivalence is found to be present.

Lastly, Piaget conducted a long series of experiments to investigate the *cardinal* (4 = 1 + 1 + 1 + 1) and *ordinal* (4 = 3 + 1) properties of numbers. One of the important features of cardination is the ability to classify. Thus in the bottle and glass experiment, the idea that the class "bottle" is invariant with respect to the class "glass" is very important. This goes a stage further when the child is asked to classify objects and then to combine them into a new class — an operation which is the basis of ordinary addition. To demonstrate this, Piaget gave his children some brown beads and a much smaller quantity of white ones; both groups of beads were wooden and belonged to the concept"wooden bead". The child at stage one correctly maintained that there were more brown ones than white ones and agreeing that both brown and white were wooden, would then go on to make the surprising claim that a necklace made out of brown beads would be longer than one made out of *wooden* beads 'because there are more brown ones than wooden ones.' Not until the age of seven were these children able to hold two concepts in mind simultaneously and thus to grasp the logical (and mathematical) truth that the part is never greater than the whole.

Using a graduated series of ten little rods, Piaget found three similar stages in the development of ordination or seriation. At first the child is only capable of global 'greater than' or 'less than' judgments, and can construct only a simple series of rods increasing in length. At the second stage, he can seriate will enough, but when the series is disarranged internally he is unable to correct it by reference to the number of elements preceding a given place in it.

Stage III (7-11 years)

Piaget designates this period as the period of concrete operations. In the references I have been able to consult, there is little explicit mention of experiments carried out on children in this actual range. Piaget likens the arrival of the last sub-stage mentioned above, at which reversibility and the principle of conservation are attained, to a kind of thawing out of the previous intuitive structures, which often takes place abruptly. In the experiment of pouring the beads, for example, "there always comes a time between 6½ and 7¼ years when the child's attitude changes: he no longer needs to reflect, he decides, he even looks surprised that the question is asked, he is *certain* of the conservation." After further consideration of his results, Piaget concludes that "the various transformations involved — reversibility, combination of compensated relations, identity, etc. — in fact depend on each other and amalgamate into an organized whole." Each is really new despite its affinity with

the corresponding intuitive relation that was already formed at the previous level.

In practice these operational groupings lead to the following structures or logical operations.

1. *Fitting classes together.* He has now formed the concept of a class and can perform mentally the operation of classification. He can go on to join classes together to form more inclusive classes, e.g. $5 + 3 = 8$.

2. *Serialising asymmetrical relations.* e.g. He can make the deduction: $A<B, B<C \therefore A<C$.

3. *Advent of the number system.* The number system is the joint product of classification and ordering or seriation. These are blended into a single operational whole, so that the unit 1 is simultaneously an element in a class (1 is included in 2, and 2 in 3, etc.) and in a series.

Furthermore, the stability and consistency of these systems of operations or *groups* depend on their possessing five properties familiar to mathematicians. They are closure, reversibility, associativity, identity, together with a fifth called *tautology* in the case of classes and relations, and *iteration* in the case of numbers.

Yet the operations capable of being performed at this stage are constantly tied to action. For example, the child understands class-inclusion in the 'wooden beads' experiment by the age of 8 yet does not solve a verbal test of identical structure until much later. Thus all forms of constancy are not attained. Another experiment involves the modelling of two pellets of dough. The child models them into the same shape, size and weight. Then one of them is modified — into a roll, say — and the child is asked whether the quantity of dough, the weight and the volume remain the same. Quantity is recognized as conserved at the age of 7-8 years, yet up to 9-10 years, the child will dispute that weight is conserved, at which age it then accepts this conservation, while still denying conservation of volume until the age of 11 or 12 years.

The child then is able to generalize and to form and use the concepts of class, relation, and number, but the principles of conservation does not hold in all systems of ideas, emerging later in some systems than in others. The child is still capable of only a limited from of reasoning, which is tied to his own concrete experience.

Stage III (*b*) 11 *years and over*

At early adolescence, ability to perform abstract operations becomes apparent. Unlike the *child,* who concerns himself only with actions in progress, the *adolescent* thinks beyond the present and forms theories about everything. This reflective thought exists

from the age 11-12 years, when the individual becomes capable of reasoning on the basis of simple assumptions which have no necessary validity of an inference, as opposed to agreement of the conclusions with experience. He can consider hypotheses which may or may not be true and work out what would follow if they were true.

Consider, for example, the following problem "Edith is fairer than Susan; Edith is darker than Lily; who is the darkest of the three?" This is essentially a simple problem of seriation, which if posed in concrete terms, is solved soon after the age of seven, yet in this form it is rarely solved until the age of 12. Before then, we find reasoning like the following. "Edith and Susan are fair, Edith and Lily are dark, therefore Lily is darkest, Susan is the fairest and Edith in between." The cause of the difficulty is simply that the premises are given as pure verbal postulates and the conclusion is to be drawn without recourse to concrete operations.

Reasoning that concerns action or reality consists of a first degree grouping of operations so to speak, i.e. internalised actions that have become capable of combination and reversal. Formal thought, on the other hand, consists of reflecting on operations or on their results and consequently effecting a second-degree grouping of operations, i.e. operating on operations. The ability to use branches of logic known as the *algebra of classes* and *algebra of relations,* which the child possessed at the concrete-operations stage, is now supplemented by forms of reasoning bearing on the relations between propositions or sentences, which constitute the *calculus of propositions.*

The Development of Spatial Concepts

The evolution of spatial relations proceeds both at the perceptual level and at the level of thought or imagination. Thus by the age of 6 months, an average child can distinguish between a circle and triangle visually presented, but it is much later before he can *represent* these figures to himself, i.e. before he has the *concept* of space.

Piaget and Inhelder have studied the child's conception of space extensively. Their results lead them to suggest that a child's first spatial concepts are topological ones, i.e. concepts which are independent of change in size or shape of the figure and which involve qualitative properties such as proximity and separation, open and closed, inside and outside. Topological space allows analysis in which each figure is considered in isolation whereas in projective and Euclidean space, objects are located relative to one another according to perspective or projective systems, or according to coordinate axes respectively, i.e. in terms of some more complex common spatial structure.

In this brief description it is impossible to give more than a

glimpse of Piaget's work in this area. It almost all relates to ages no greater than 7 years or so. I shall mention three sets of experiments only.

Firstly, Piaget has investigated in a fairly systematic manner the way in which perception of shapes develops. By means of ingenious experiments "haptic" perception in which the child could feel but not see the shape to be identified, Piaget again found a regular series of fairly well-defined stages of development.

Stage 1 (3½ years on)

The child is able to identify shapes only in terms of topological attributes; thus whilst a square and circle are indistinguishable from each other or any other closed surface, they can be distinguished readily from shapes with different topological characteristics.

Stage 2 (4½-6 years)

Differentiation between rectilinear and curvilinear shapes develops. At first it is crude (sub-stage A), then the child begins to search for significant cues with respect to angular properties and dimensions (sub-stage B), and finally successful differentiation of rhombus and trapezium occurs together with frequent recognition of more complex shapes (sub-stage C).

Stage 3 (6-7 years)

The child can now distinguish between complex forms, such as the swastika, and simultaneously take account of order and distance.

Non-metric characteristics are preserved under projective transformations and Piaget has carried out a second set of experiments by which he claims to show that the child learns to understand projective properties before it can grasp Euclidean relationships. Using a table, and a set of "telegraph poles" made of matchsticks, he finds three stages, when the child is asked to make a straight line of poles. In stage 1, the "poles" are simply placed *near* each other, but not straight; in stage 2, the child can use the edge of the table as a guide, but fails when this aid is not available; in stage 3, the child can construct an "independent" straight line, nearly always by "sighting", i.e. placing the head so that all the poles disappear simultaneously behind the near end-pole. According to Piaget, he is using a projective property of the straight line.

In yet a third series of experiments, concerned with similarity and proportion, similarity in the Euclidean sense of considering equality of angles, proportions of corresponding sides, and making rudimentary measurements only appeared at the third sub-stage at the age of about 7 years. Relationships now appear to be organized and ordered into stable systems in which each operation has an inverse, relations become transitive and are not easily disrupted by perceptual factors as before.

Studies by Other Investigators

A number of investigators, particularly in the United Kingdom, have been carrying out extensive work to test Piaget's results. In general, they have found the same sequence of stages of development, but sometimes the ages at which the stages occurred have varied markedly from those reported by Piaget, and it is suggested that stage level is better determined by mental than chronological age. Studies by Carpenter, Luzer, and Churchill suggest that cultural and educational factors such as appropriate programs of play situations involving grouping, seriating, matching and ordering may bring forward the various stages of development.

The results of recent research by Lovell on spatial concepts agree with those of Piaget in some parts, but are at variance in others. In particular, Lovell's results with the "telegraph poles" experiment lead him to suggest that the question of whether the child's conception of space begins with topological concepts which are transformed concurrently into concepts of projective and Euclidean space should remain an open question until further experiments have been carried out.

Another investigator, Dienes, criticises Piaget for being concerned with only the analytic mode of thinking, and suggests that legitimate mathematical thought may be either analytic or synthetic. Work is currently in progress to test Dienes' hypothesis.

Educational Implications

Readiness and Curriculum Sequences

If Piaget is right, and the development of thinking proceeds in relatively unvarying sequences, though not at predeterminated rates, the concept of "readiness" comes to be of the first importance. For example, even if the child is fluent in his use of number words and can do rote counting, this does not allow us to conclude that he knows what he is talking about. There is even a danger of language becoming a substitute for thought. The wooden beads experiment, too, reveals that only at a certain stage (about 7 according to Piaget) do children realize that the part is never greater than the whole. Until they do, they are incapable of *understanding* addition or subtraction. To give the child the fullest help, we should know how far he has advanced, and what the next step will have to be. *Thus the teacher must understand the sequences of development before he can further them.* This does not mean that the teacher must wait until a given chronological or even mental age before teaching the child a given process, but that he must know what educational experiences will best facilitate the child's maturation at that point. Readiness tests and curriculum sequences designed in accordance with Piaget's

results from different stages of maturation in each of the different concepts would seem to assume considerable importance. As far as the early development of spatial concepts is concerned, the issue is not fully resolved, yet the evidence points to the advisibility of giving plenty of experience that demands no more than topological awareness and capacities. Of course, this idea of readiness has been in vogue in North America for some time, and is proving of great value. Yet its origin was pragmatic, rather than theoretical.

The same considerations apply at more advanced age levels. When does the stage of abstract or formal operation begin for the bright child, for the average child, for the child of below average ability in mathematics? We have seen that different concepts appear to be "conserved" at different ages — quantity before weight, weight before volume. What spread is there in these occurrences as regards chronological and mental age? Our current and proposed mathematics courses at the grade 9 and 10 levels seem to demand considerable ability to reason logically. It would seem advisable to defer sweeping changes in curriculum sequences until some of these questions are more adequately answered.

Teaching Methods

We saw earlier that the "operations", which are central to Piaget's view of intellectual development, are internalised actions, and that the child must actively construct his own thought system. The question for the teacher is then: how best can I help him to do so? One thing is clear — that if we regard development in this way, it is quite inconsistent to talk of "giving" the child ideas or thoughts or even experiences. We cannot "give" him these or a ready-made understanding; we can only help him to construct them for himself.

Aebli conducted a study in an attempt to devise methods in line with Piaget's work, and developed the following principles.

1. Always begin by trying to ensure that the child is faced with a problem which is genuine and meaningful to him.

2. Have him engage in active attempts to find his own solutions, allowing him to undertake any relevant physical manipulations.

3. Get him to move away gradually from these physical activities towards the point when he can solve the problem representationally by the manipulation of symbols.

These are, of course, accepted as sound teaching principles today, although they are not always practised — for various reasons.

One further point, however, which is not so generally known or accepted, and on which Aebli insists, is that the various operations which must be distinguished from one another could be taught together, since they must be not only distinguished by related. Thus

the concepts of perimeter and area of a rectangle should be taught together, and not separately to enable the child to come to a genuine understanding of them.

Furthermore, the growth of intelligence is a cumulative process in that any loss of opportunity, and especially loss at the early stages, must have its influence. It is clear then that a suitable environment must be provided so that the child may engage in these necessary actions and experiences.

Piaget emphasizes that the development of intelligence is dependent not only on the physical but on the *social* environment. Thus he would agree that there should be provision for such number experiences in the first years of school life, a proportion of which should be social.

What place is there for concrete materials? It would seem that those materials which help the child to gain experience in the areas of number operations analysed by Piaget such as matching, seriating, correspondence, etc., would be most helpful. Teachers can readily adapt toothpicks, buttons, etc. to serve such purposes. Two sets of materials which attempt to represent the actual structure of the number system and which employ both counting and measuring — ordination and cardination — are those devised by Stern and Cuisenaire. The basic idea is that the child, by manipulating rods or blocks in a systematic and controlled way will discover for himself the meanings of number relations and number concepts generally. This emphasis on self-discovery is in accord with Aebli's principles outlined above. The Cuisenaire system in particular is being experimented with in many countries, and results to date are very encouraging. Yet a third approach, advocated by Dienes, which is partly based on Piaget's work, and which uses sets of blocks, and other concrete materials, also looks very promising.

Conclusion

Much that Piaget's work has revealed is not new. What then is the significance of his contributions to education? Firstly, he offers us a new theoretical analysis of the organization of mature, intelligent thinking — an analysis which may help us to understand better the principal characteristics of the type of activity which teachers should be concerned to encourage. Secondly, he offers us much evidence — albeit evidence which needs extensive corroboration — about the details of the stages and difficulties which take place as this development proceeds. The fact that these findings are often surprising is a measure of their importance, for if he is right, he is removing widespread misunderstanding, and ignorance. In our current thinking about mathematical education we need to reflect deeply on what he has to say to us, and assess its significance as we

consider what curricula and teaching methods are the most appropriate and effective for our schools in this era of computers and nuclear engineering.

REFERENCES

Berlyne, D. E. "Recent devolopments in Piaget's work." *British Journal of Educational Psychology,* Vol. 27, February, 1957.

Biggs, J. B. "The Development of Number Concepts in Young Children." *Educational Research,* Vol. 1, No. 2, February, 1959.

Burt, C. "Pioneer of Applied Insight." *Times Educational Supplement,* December 6, 1957.

Cuisenaire, G. and Gattegno, C. *Numbers in Color.* London: Heinemann, 1954.

Dienes, Z. P. "The Growth of mathematical concepts in children through experience." *Educational Research,* Vol. II. No. 1, November, 1959.

Dodwell, P. C. "The Evolution of Number Concepts in the Child." Mathematics Teaching — The Bulletin of the Association for Teaching Aids in Mathematics, No. 5, 1957.

..... The Spatial Concepts of the Child. *Mathematics Teaching.* No. 9, April, 1959.

Donaldson, M. "The Work of Jean Piaget." *The Scottish Educational Journal,* 4th, 11th and 18th December, 1949.

Ives, L. "Piaget's Investigations." *The New Era.* Vol. 40, No. 6, June, 1959.

Lawrence, E. et al.—*Some Aspects of Paiget's Work.* National Froebel Foundation, 2, Manchester Square, London, W.1, England. Third Edition, 1959.

Lovell, K. "A Follow-Up Study of Some Aspects of the Work of Piaget and Inhelder on the Child's Conception of Space." *British Journal of Educational Psychology.* Vol. 29, June, 1959.

Peel, E. A. "Experimental Examination of Some of Piaget's Schemata concerning Children's Perception and Thinking, and a Discussion of their Educational Significance." *British Journal of Educational Psychology.* Vol. 29, June, 1959.

Piaget, J. *The Psychology of Intelligence.* London, England: Routledge and Kegan Paul Limited, 1951.

..... *Judgment and Reasoning in the Child.* London, England: Routledge and Kegan Paul Limited, 1951. (reprint)

..... *The Child's Conception of Number.* London, England: Routledge and Kegan Paul Limited, 1952.

..... *The Child's Conception of Space.* London, England: Routledge and Kegan Paul Limited, 1956.

Robinson, F. G. *The psychological basis of axiometric mathematics,* unpublished Ph.D. thesis, University of Alberta, Canada, 1959.

Smith, E. P. and Henderson, K. B. "Proof — Chapter 4 of *The Growth of Mathematical Ideas,* 24th Yearbook of the National Council of Teachers of Mathematics, 1201 Sixteenth Street, N.W., Washington 6, D. C., U.S.A.

Stern, C. *Children Discover Arithmetic.* New York: Harper and Brothers, 1949.

Thomson, H. *The Psychology of Thinking.* Pelican Paperback, 1959.

DISTRIBUTION OF FINAL MARKS IN NINE COURSE AREAS IN ALBERTA SENIOR HIGH SCHOOLS*

DONALD B. BLACK
Division of Educational Psychology
Faculty of Education
University of Alberta

The transferring student presents many problems to the principal, teacher and guidance counsellor. If the student transfers from outside of the Province, there are basic questions of compatibility of curriculum. However, if the transferring student is from within the Provincial borders, curriculum compatability is not a major problem but the meaning of the reported marks may well be. Theoretically, a common curriculum should mean common evaluation but such is rarely the case except in Grades IX and XII where Departmental examinations are administered in selected subject areas. Different schools do, in fact, rate students differently. In such matters, discrepancies relating to the size of high schools have been found which are of too great a magnitude to be reconciled. The small school is inevitably at a disadvantage over the larger schools in providing stable student population groups from year to year. However, even in very large schools where a number of classes may take the same course, but under different teachers, there often are wide differences in the final average mark assigned. On the other hand, it is argued that teachers in the smaller schools get to know each student better and evaluation benefits positively from this. It is not the purpose of this paper to argue the case for or against the validity of ratings. Instead, by recognizing that differences do occur, and that these are associated with the size of school, this paper will report normative data for Grades X, XI and XII for final marks reported in nine subject matter patterns or areas by size of school.

Sample

The sample chosen was 10,709 students who wrote Grade IX Departmental examinations in June, 1955 and entered Grade X in Alberta high schools in the fall of 1955. Of this group, 8,561 enrolled in Grade XI the following year, and 6,309 in Grade XII in the fall of 1957. The high school grades reported are for these students. It is considered that, while this sample does not include students entering Alberta high schools from outside the Province during the three years concerned, the sample is sufficiently large, representing

*From data collected for the Cameron Royal Commission on Education.

91, 89 and 75% respectively, of the reported total Provincial Grade X, XI and XII population (Annual Reports: 1956, 1957, 1958) that it will adequately reflect the marks assigned in these grades throughout the Province.

Data

All data for the study were taken from the Department of Education records. In most instances, the data were taken directly from cards completed by the teachers concerned for each particular course. Further, Department "A" cards were used to identify the type of school attended by the students in each of the years concerned.

Type of School

For the purpose of analysis, five types of schools have been used:

(1) Small High Schools—which represent schools offering programs using shorter periods than the standard high school period. More specifically, these schools have less than one teacher per high school grade taught.

(2) Small Standard-time High Schools—these schools operate their programs on a conventional time-table and have one teacher for each high school grade taught.

(3) Medium High Schools—consist of schools with four to eight teachers.

(4) Large High Schools—these schools have more than eight teachers but are not identified as Composite High Schools.

(5) Composite High Schools—these are schools with more than eight teachers and which, by virtue of the high school program offered, have been identified by the Department of Education as Composite High Schools.

Categorization of High School Courses

During the period this study covers, 117 different courses were offered in Alberta high schools. It would here be impossible to present an analysis of the marks in each course. Instead, these 117 courses have been grouped into nine academic areas or patterns. Students taking more than one course falling in any one of these areas had their marks averaged. Only the average mark then, is reported. The nine course areas and the specific courses comprising these fields, are listed below:

(1) English Options:

Literature 10, 20; Language 10, 20; English 30*

(2) Social Studies Options:

Social Studies 10, 20, 30*

(3) Mathematics Options:

Mathematics 10, 11, 12, 20, 21, 22, 30*, 31 and 32

(4) Science Options:

Science 10, 20; Biology 11, 32* Chemistry 30* and Physics 30*

(5) Foreign Language Options:

French 11, 20, 21, 30*, 31; Spanish 10, 20, 30; German 20, 30*; Latin 11, 20 and 30*

(6) Commercial Options:

Record Keeping 10; Bookkeeping 20, 30; Typewriting 10, 20, 30; Shorthand 10, 20; Office Practice 20, 30; Business Fundamentals 10; Merchandizing 20; Secretarial Training 30 and Business Machines 30

(7) General Options:

Health and Personal Development 10; Physical Education 10, 20; Art 10, 20, 30; Music 10, 20, 30; Drama 10, 20, 30; Arts and Crafts 10, 20, 30; Sociology 10; Literature 21; Language 21; Law 20; Psychology 20; Sociology 20 and Economics 30

(8) Home-making Options:

Home Economics 10, 11, 12, 20; Home Economics Crafts 10; Needlework 10; Child Care and Home Nursing 10; Fabrics and Dressing 10, 20, 30; Foods and Nutrition 10, 20, 30; Clothes Selection and Design 20, 30; and Homes and Furnishings 20

(9) Technical Options:

Agriculture 10, 20, 30; General Mechanics 15, 16, 17; Drafting 10, 20; Woodwork 10,20,21.30; and Printing 10 and 20

*Grade XII Departmental Examinations administered in these subjects.

Analysis of Data

All marks were classified according to the option areas listed above. When more than one course was taken in any option area these marks were averaged to the nearest whole number. Students were identified with the type of the high school attended and this

was coded beside the student number. All data were collected on one IBM card for each student for each grade of high school.

The data were then analysed to produce distributions of marks. The number of marks falling in any one interval within a category was divided by the total number of students attempting courses in that option area to give the percentage of scores falling within that interval. The percentage distributions of marks by option area, type of school attended and grade level are presented in Tables I - 1X. Also included in these tables are the percentage of students enrolled in any given year who did not take courses in the option area.

TABLE I

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN ENGLISH OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-38	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools	X	2511	6.2	17.5	28.8	24.3	16.9	6.0	0.3	.....
(Less than 1 Teacher/	XI	1207	2.7	12.5	25.9	28.9	20.2	8.8	1.1	0.4
Grade)	XII	958	21.9	29.5	21.6	14.9	8.4	3.6	0.3	2.5
Small Standard Time	X	2036	6.2	17.5	26.8	25.6	16.6	7.0	0.3	0.1
High Schools	XI	1577	6.9	18.9	25.7	23.6	17.5	6.8	0.6	0.5
(1 Teacher/Grade)	XII	1100	15.7	27.1	25.3	18.7	9.4	3.6	0.2	2.5
Medium High School	X	1752	8.2	19.1	27.2	24.2	15.8	5.1	0.5	.....
(4 - 8 Teachers)	XI	1587	8.0	21.2	24.1	23.2	17.2	5.0	0.2	0.4
	XII	1274	12.7	26.7	25.4	18.9	11.1	5.1	0.1	1.6
Large	X	1016	4.7	14.6	27.1	29.3	18.2	5.5	0.6	0.3
High Schools	XI	1080	7.9	15.3	24.9	26.3	17.3	7.4	0.9	0.6
(Over 8 Teachers)	XII	918	6.2	21.9	26.2	21.6	16.6	7.8	0.3	3.8
Large Composite	X	2564	9.2	20.5	26.8	24.8	14.1	4.4	0.2	1.0
High Schools	XI	2114	8.3	21.4	27.6	25.2	12.9	4.3	0.3	0.6
(Over 8 Teachers)	XII	1588	10.5	26.4	25.2	21.2	10.5	5.8	0.5	1.8
	X	10709	7.2	18.2	27.2	25.2	16.1	5.7	0.4	0.5
TOTAL	XI	8561	6.7	18.2	25.8	25.6	16.7	6.4	0.6	0.8
	XII	6309	13.0	26.7	24.8	19.3	10.8	5.1	0.3	2.9

TABLE II

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN SOCIAL STUDIES OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	7.1	18.2	24.3	23.5	16.1	9.5	1.3	.....
	XI	1207	3.4	12.1	21.0	26.9	20.8	13.4	2.4	0.8
	XII	958	22.2	26.9	22.1	17.6	8.5	2.6	0.1	3.1
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	8.2	17.2	21.9	24.1	17.6	9.8	1.2	0.1
	XI	1577	6.2	16.2	22.7	24.6	18.0	10.6	1.7	1.4
	XII	1100	17.2	25.2	22.4	21.2	9.8	4.2	.....	2.1
Medium High School (4 - 8 Teachers)	X	1752	9.1	19.3	24.3	21.9	14.9	9.5	1.0	.....
	XI	1587	8.8	19.9	21.5	23.0	15.1	9.9	1.8	0.9
	XII	1274	15.4	24.0	24.6	21.5	10.1	4.2	0.2	2.4
Large High Schools (Over 8 Teachers)	X	1016	5.5	14.9	22.5	26.2	18.6	10.8	1.5	0.4
	XI	1080	7.1	13.6	26.0	24.6	18.1	9.2	1.4	1.3
	XII	918	10.2	18.7	23.7	24.6	15.0	6.8	1.0	4.4
Large Composite High Schools (Over 8 Teachers)	X	2564	9.6	17.8	23.9	23.7	16.7	6.8	1.5	1.0
	XI	2114	10.9	20.8	25.7	22.7	13.4	5.7	0.8	0.6
	XII	1588	12.8	24.8	24.5	20.6	10.1	6.3	0.9	1.8
TOTAL	X	10709	8.1	17.8	23.3	23.7	16.6	9.1	1.4	0.6
	XI	8561	7.4	16.8	23.2	24.2	17.0	9.8	1.6	1.3
	XII	6309	15.1	24.0	24.0	20.9	10.6	4.9	0.5	3.2

TABLE III

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN MATHEMATICS OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	10.9	17.4	24.7	18.8	13.8	11.7	2.7	2.7
	XI	1207	6.1	15.3	28.3	21.3	15.7	10.2	3.1	12.1
	XII	958	21.6	27.0	24.1	16.7	8.4	1.9	0.3	28.9
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	12.3	17.9	22.3	20.0	14.9	10.0	2.6	2.8
	XI	1577	8.3	16.5	28.3	21.7	12.9	10.6	1.7	11.3
	XII	1100	14.5	19.8	27.5	21.4	11.6	5.1	0.1	21.9
Medium High School (4 - 8 Teachers)	X	1752	14.1	17.3	23.3	20.3	13.2	9.0	2.8	2.6
	XI	1587	7.0	18.4	24.5	20.5	15.4	11.3	2.9	15.1
	XII	1274	11.4	23.4	27.9	19.4	13.0	4.4	0.5	24.0
Large "Academic" High Schools (Over 8 Teachers)	X	1016	13.1	16.9	24.7	19.7	12.4	9.2	4.0	3.9
	XI	1080	8.2	15.5	24.9	22.5	15.0	9.9	4.0	13.4
	XII	918	9.8	22.4	26.1	20.3	14.4	5.0	2.0	22.2
Large Composite High Schools (Over 8 Teachers)	X	2564	13.1	19.7	25.3	20.7	12.7	6.6	1.9	4.6
	XI	2114	12.5	19.9	26.9	18.9	13.2	6.6	2.0	29.7
	XII	1588	9.9	24.8	28.1	20.1	11.4	4.3	1.0	30.0
TOTAL	X	10709	12.4	17.9	24.2	19.9	13.6	9.3	2.7	3.9
	XI	8561	8.5	17.0	26.5	21.0	14.5	9.8	2.7	17.7
	XII	6309	12.9	23.8	26.9	19.5	11.8	4.3	0.8	26.4

TABLE IV

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN SCIENCE OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	6.2	17.2	25.5	24.4	17.2	8.0	1.5	1.1
	XI	1207	2.5	10.7	24.2	26.4	21.0	13.2	2.0	3.9
	XII	958	27.5	27.7	20.2	15.6	6.6	2.2	0.2	6.1
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	7.5	16.0	26.5	24.0	15.8	9.0	1.2	1.5
	XI	1577	7.4	17.3	25.7	22.0	16.4	9.9	1.3	10.3
	XII	1100	18.9	24.8	24.8	19.6	9.6	2.1	0.2	4.2
Medium High School (4 - 8 Teachers)	X	1752	7.5	15.5	28.3	21.9	16.5	8.5	1.8	9.4
	XI	1587	5.5	16.2	27.6	22.1	14.1	12.6	1.9	14.8
	XII	1274	15.3	25.4	26.0	21.3	9.2	2.5	0.3	9.3
Large "Academic" High Schools (Over 8 Teachers)	X	1016	8.3	15.5	25.9	22.6	17.8	8.3	1.6	5.9
	XI	1080	7.8	15.9	27.8	21.0	17.0	8.2	2.3	16.7
	XII	918	14.0	21.2	28.7	20.9	10.2	4.0	1.0	9.2
Large Composite High Schools (Over 8 Teachers)	X	2564	7.1	18.2	26.7	25.1	14.0	7.8	1.1	20.6
	XI	2114	6.1	15.1	26.0	23.6	19.1	8.3	1.8	28.3
	XII	1588	12.5	21.7	25.8	21.1	13.0	5.0	0.9	20.2
TOTAL	X	10709	7.2	16.7	26.5	23.8	16.2	8.2	1.4	8.4
	XI	8561	5.5	14.5	25.9	23.5	17.9	10.8	1.9	15.7
	XII	6309	16.9	24.2	25.3	19.9	9.9	3.3	0.5	11.3

TABLE V

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN FOREIGN LANGUAGE OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	5.9	7.5	9.3	24.4	22.7	23.8	6.4	93.1
	XI	1207	6.0	11.8	23.1	24.1	19.0	12.6	3.4	25.4
	XII	958	20.2	19.8	25.9	17|7	11.0	3.9	1.5	32.6
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	17.4	4.1	15.4	17.3	16.3	17.3	12.2	95.2
	XI	1577	7.3	13.3	20.6	21.4	17.7	15.1	4.6	24.8
	XII	1100	15.9	19.6	25.9	20.0	13.5	4.7	0.4	27.1
Medium High School (4 - 8 Teachers)	X	1752	9.8	9.8	21.3	20.2	15.9	18.6	4.4	89.6
	XI	1587	8.6	15.1	20.7	20.1	17.3	13.6	4.6	30.3
	XII	1274	12.5	21.5	25.0	21.0	14.7	3.7	1.6	35.0
Large "Academic" High Schools (Over 8 Teachers)	X	1016	3.9	15.9	19.7	21.1	16.8	15.4	7.2	79.5
	XI	1080	10.9	15.1	23.5	19.1	16.4	11.6	3.4	26.5
	XII	918	9.7	20.3	26.5	23.2	12.4	6.0	1.9	26.9
Large Composite High Schools (Over 8 Teachers)	X	2564	6.2	10.9	18.8	20.6	21.4	15.9	6.2	89.2
	XI	2114	15.5	14.1	25.5	17.8	14.7	9.1	3.3	42.7
	XII	1588	8.9	20.8	25.4	22.6	15.2	5.6	1.5	40.1
TOTAL	X	10709	7.0	9.9	17.2	21.0	19.8	17.9	7.2	90.0
	XI	8561	8.7	13.7	22.5	20.4	17.1	13.7	3.8	30.9
	XII	6309	13.0	20.5	25.5	21.0	13.8	4.8	1.4	33.1

TABLE VI

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN COMMERCIAL OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	2.5	9.9	22.2	31.5	21.4	10.8	1.7	30.9
	XI	1207	2.2	8.8	18.7	28.4	24.9	14.4	2.6	45.5
	XII	958	1.5	8.6	14.2	27.5	33.0	14.2	1.0	79.4
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	28.4	8.4	17.4	22.8	13.0	8.3	1.7	26.6
	XI	1577	2.9	9.8	21.4	27.1	22.2	13.5	2.6	45.3
	XII	1100	2.8	12.2	18.3	30.0	25.0	9.5	2.2	83.6
Medium High School (4 - 8 Teachers)	X	1752	6.7	14.5	25.5	24.6	18.8	8.6	1.3	24.0
	XI	1587	3.8	12.1	24.2	24.9	19.0	13.1	2.9	41.8
	XII	1274	1.1	13.5	23.8	27.9	22.1	9.1	1.9	71.6
Large High Schools (Over 8 Teachers)	X	1016	6.4	15.7	30.9	27.5	11.5	5.8	2.2	27.5
	XI	1080	5.7	16.1	27.0	25.8	15.3	8.1	2.0	54.1
	XII	918	3.0	18.7	25.8	22.7	19.7	6.6	3.5	78.4
Large Composite High Schools (Over 8 Teachers)	X	2564	9.3	22.5	28.0	23.5	10.2	4.6	1.9	43.7
	XI	2114	7.8	19.8	27.3	22.8	14.5	6.4	1.4	52.9
	XII	1588	5.0	14.2	30.0	23.4	18.8	6.6	2.0	79.6
TOTAL	X	10709	5.1	14.2	25.5	27.7	16.9	8.8	1.8	32.8
	XI	8561	4.3	12.7	23.9	25.5	19.7	11.5	2.4	47.8
	XII	6309	3.0	13.3	24.2	26.0	22.2	9.2	2.1	74.7

TABLE VII

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN GENERAL OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	.6	5.4	22.6	39.8	25.1	6.1	0.4	1.4
	XI	1207	1.0	5.1	18.4	36.2	27.9	10.1	1.3	14.6
	XII	958	6.3	8.7	19.9	35.9	20.5	7.8	0.9	65.3
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	.8	5.6	25.4	38.5	24.4	5.2	0.1	0.1
	XI	1577	4.3	12.3	25.2	28.6	19.3	8.8	1.5	26.3
	XII	1100	11.3	12.0	25.8	29.5	15.3	6.1	.....	70.4
Medium High School (4 - 8 Teachers)	X	1752	0.4	7.1	27.7	39.2	21.5	3.6	.05	0.2
	XI	1587	3.3	9.8	19.3	32.7	21.0	11.8	2.1	27.9
	XII	1274	7.7	9.0	25.9	28.4	18.2	9.9	0.9	65.1
Large "Academic" High Schools (Over 8 Teachers)	X	1016	1.2	4.5	22.6	44.2	22.3	5.2	.....	0.3
	XI	1080	3.7	8.5	20.5	25.9	25.0	13.7	2.7	34.4
	XII	918	13.3	8.7	16.6	34.4	19.1	6.6	1.3	73.7
Large Composite High Schools (Over 8 Teachers)	X	2564	2.2	10.0	31.6	38.5	16.2	1.4	.04	0.7
	XI	2114	3.1	7.0	19.5	34.7	24.8	10.0	0.9	56.9
	XII	1588	10.4	5.7	19.8	27.0	25.5	10.3	1.3	71.3
TOTAL	X	10709	1.1	6.8	26.3	39.3	22.1	4.3	0.1	0.8
	XI	8561	2.8	8.2	20.4	32.4	23.8	10.8	1.6	33.8
	XII	6309	9.7	8.4	22.4	30.4	20.0	8.3	0.8	69.5

TABLE VIII

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN HOME-MAKING OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	.9	2.7	11.4	27.9	33.9	19.5	3.7	77.7
	XI	1207	.3	1.7	9.8	19.9	34.6	27.5	6.2	79.1
	XII	958	.....	4.0	14.0	20.0	44.0	16.0	2.0	94.8
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	.5	4.5	12.5	29.0	32.5	17.8	3.2	70.9
	XI	1577	1.4	3.1	9.7	22.2	35.9	24.9	2.8	75.8
	XII	1100	.....	6.5	23.0	13.1	41.0	16.4	.....	94.5
Medium High School (4 - 8 Teachers)	X	1752	.6	6.7	13.5	28.6	34.7	14.7	1.2	71.7
	XI	1587	.3	4.6	12.6	29.6	26.6	22.6	3.7	77.9
	XII	1274	.....	.....	7.1	39.3	22.6	31.0	.....	93.4
Large High Schools (Over 8 Teachers)	X	1016	4.9	7.4	13.9	27.9	29.5	16.4	.....	88.0
	XI	1080	1.8	8.2	12.7	23.6	37.3	15.5	0.9	89.8
	XII	918	.....	2.2	11.1	40.0	35.6	11.1	.....	95.1
Large Composite High Schools (Over 8 Teachers)	X	2564	4.4	8.8	19.1	27.3	27.0	12.8	0.6	78.7
	XI	2114	2.9	6.9	20.9	26.6	27.0	13.4	2.3	77.4
	XII	1588	2.7	5.2	15.6	37.4	21.9	16.7	0.5	87.9
TOTAL	X	10709	1.7	5.6	13.8	27.7	31.9	16.9	2.4	76.3
	XI	8561	1.4	4.5	13.4	24.5	31.5	21.2	3.5	79.3
	XII	6309	1	3.8	14.2	31.8	29.9	18.5	0.8	92.4

TABLE IX

FINAL MARK DISTRIBUTIONS IN PERCENTAGES OF ALBERTA HIGH SCHOOL STUDENTS IN TECHNICAL OPTIONS BY TYPE OF SCHOOL

Type of School	Grade	N	FINAL MARKS							
			0-39	40-49	50-59	60-69	70-79	80-89	90-99	Not Taken
Small High Schools (Less than 1 Teacher/ Grade)	X	2511	1.5	6.2	21.2	34.4	28.0	7.4	1.3	73.1
	XI	1207	.8	3.9	16.1	29.3	29.1	17.4	3.4	77.4
	XII	958	.....	.....	8.3	50.0	33.4	8.3	.....	97.5
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	2.5	6.1	20.4	31.6	28.9	9.5	1.0	69.8
	XI	1577	8.7	3.3	18.2	35.7	30.4	11.2	0.5	74.6
	XII	1100	.....	3.6	10.9	49.1	27.3	9.1	.....	95.0
Medium High School (4 - 8 Teachers)	X	1752	2.4	6.0	27.8	32.0	21.5	9.9	0.4	71.6
	XI	1587	1.1	4.9	23.8	29.5	24.3	15.1	1.3	76.7
	XII	1274	1.6	8.2	31.2	27.9	24.6	4.9	1.6	95.2
Large "Academic" High Schools (Over 8 Teachers)	X	1016	4.7	1.2	13.0	28.2	28.2	23.5	1.2	91.6
	XI	1080	3.3	8.2	26.2	27.1	22.9	9.8	2.5	88.7
	XII	918	6.2	6.3	43.8	12.5	18.7	12.5	.....	96.5
Large Composite High Schools (Over 8 Teachers)	X	2564	5.8	14.7	27.1	31.5	15.1	5.3	0.5	66.0
	XI	2114	2.8	10.5	24.7	33.6	19.1	7.5	1.8	71.1
	XII	1588	1.2	11.5	23.8	36.6	20.6	6.6	.....	85.7
TOTAL	X	10709	4.0	8.8	23.9	32.9	22.5	7.8	0.9	72.0
	XI	8561	1.6	6.4	21.2	32.2	24.6	12.2	1.8	76.7
	XII	6309	1.2	8.4	22.6	36.3	23.8	7.1	0.5	93.1

TABLE X

PERCENTAGE OF STUDENTS ATTEMPTING COURSES IN NINE AREAS FOR THREE GRADES OF HIGH SCHOOL BY TYPE OF SCHOOL

Type of School	Grade	N	English	Social Studies	Mathematics	Science	Foreign Language	Commercial	General	Home Making	Technical
Small High Schools (Less than 1 Teacher/Grade)	X	2511	100	100	97.3	98.9	6.9	69.1	98.6	22.3	26.9
	XI	1207	99.6	99.2	87.9	96.1	74.6	54.5	85.4	20.9	22.6
	XII	958	97.5	96.9	71.1	93.9	67.4	20.6	34.7	5.2	2.5
Small Standard Time High Schools (1 Teacher/Grade)	X	2036	99.9	99.9	97.2	98.5	4.8	73.4	99.9	19.1	30.2
	XI	1577	99.5	98.6	88.7	89.7	75.2	54.7	73.7	24.2	25.4
	XII	1100	97.5	97.9	78.1	95.8	72.1	16.4	29.6	5.5	5.0
Medium High School (4 - 8 Teahers)	X	1752	100	100	97.4	90.6	10.4	76.0	99.8	18.3	28.4
	XI	1587	99.6	99.1	84.9	85.3	69.7	58.2	72.1	12.1	23.3
	XII	1274	98.4	97.6	76.0	90.7	65.0	28.4	34.9	6.6	4.8
Large High Schools (Over 8 Teachers)	X	1016	99.7	99.6	96.1	94.1	20.5	72.5	99.7	12.0	8.4
	XI	1080	99.4	98.7	86.6	83.3	23.5	55.9	65.6	10.2	11.3
	XII	918	96.2	95.6	77.8	90.8	23.1	21.6	26.3	4.9	3.5
Large Composite High Schools (Over 8 Teachers)	X	2564	99.0	99.0	95.4	79.4	10.8	56.3	99.3	21.3	34.0
	XI	2114	99.4	99.4	70.3	71.7	57.3	47.1	43.1	22.6	28.9
	XII	1588	98.2	98.2	70.0	79.8	59.9	20.4	28.7	12.1	14.3
TOTAL	X	10709	99.5	99.4	96.1	91.6	10.0	77.2	99.2	23.7	28.0
	XI	8561	99.2	98.7	82.3	74.7	69.1	52.2	66.2	20.7	23.3
	XII	6309	97.1	96.8	73.6	88.7	66.9	25.3	30.5	7.6	6.9

Using the Tables

Tables I to X will serve to give additional meaning to marks of students transferring to new schools. A further use, however, might be in the establishment of school evaluation policy more in line with that typical of the Province. Marks determined by the teacher as distinct from the single Departmental examination system used in specific subjects in Grade XII, reveal an almost uniform higher rating of students in the smaller schools. In subject areas tested in Grade XII by Departmental examinations, there is an appreciable downward drop in marks. It is noted that this downward trend is not confined exclusively to the smaller high schools but appears uniformly throughout all schools. It hardly seems fair to students to be lulled into complacency by high marks in Grade X and XI only to face a "rude awakening" upon receipt of their Grade XII Departmental marks. The tables, then, could provide guidance to teachers in the assigning of marks to students, particularly in Grades X and XI, and the non-Departmental examination subjects in Grade XII.

But the reported data may find their best use in the counselling process within the school. The counsellor may relate the marks obtained by the student to the performance of students in similar courses throughout the Province. By so doing the counsellor can offset, to a certain degree, the misleading effects of high marks indicated above, by relating performance to relative standing independent of the actual mark received by the student.

Of passing interest, inasmuch as they reflect the high school program offered throughout the Province, are the percentages of students taking courses in the option areas for each year of high school. These data, taken from Tables 1 to IX, are summarized in Table X. Many of these reflect the influences of present high school programming practices: for example, the small percentage of students taking a first foreign language course in Grade X, the limited appeal of Mathematics and Foreign Language options in Grade XII, Science options in the Composite High Schools in Grade XII, and the vocational courses (Commercial, Home-making and Technical options) and so on.

Undoubtedly, many other statistics of specific interest to the individual reader, such as that of percentage course enrolment cited above in Table X, can be quickly determined from the basic tables. For example, a table showing percentage of students receiving marks less than 50 in option areas by grade, and so on, can be readily determined. These are some of the possible uses of the data presented.

Discussion

The material above is not without its limitations, yet it does represent the best data of its kind currently available. It questions the validity of the assumption of uniform assessment throughout the Province except in Departmental examination subjects. Yet uniform assessment is a desirable objective which could be approached possibly in two ways: first, through the acceptance of a set distribution of grades, and second, by a uniform Province-wide testing program. The former would have to be based on data supplied by the Department of Education which collects the academic record of all students. These data would be prepared for each high school course taught in the Province the previous year. This is presently possible with the current record keeping procedures and the data processing equipment and services available to the Department. The introduction of high speed computing equipment will further facilitate such data analysis; and course score distributions could be reported along with individual marks.

Even without a breakdown by type of school, such data could provide some direction towards consistency in the rating of students. It must be noted that while by comparison the smaller high shools tend to "over-rate", there are some large high schools that err equally in this regard. Conversely, not all small schools "over-rate" — a fact which rules out the possibility of a general corrective factor based, for example, on the performance of a school's students on the Grade IX and XII Departmentals. It should be noted that while some research has been done on the relationship of a variety of features of the school plant and its teaching staff to academic performance (see Mollenkoph and Melville, 1955, and Conant, 1958: pp. 24-25. 102-112), similar studies have not been attempted in Canada. Such studies would be of immense value in seeking solutions to the present problem.

The most apparent solution to the problems would be a uniform testing program administered every year in every course throughout the three grades of senior high school. Problems of size of high school, adequacy of teaching staff, extent of school equipment and other factors of a measurable nature that contribute to making differences in the overall level of student performance would be automatically compensated for. This, however, presents a cumbersome and costly solution, and the general restricting effect on course curricula that such action could evoke is a further deterrent to a total testing program at this time.

Clearly the reporting of student marks that have a reasonable uniformity of meaning is important. However, a great deal more research is needed before adequate solutions to this problem will be

found. In this connection, the recommendations of the Cameron Royal Commission on Education (1959) concerning the establishment of a Bureau of Tests and Standards and related examination procedures and statistical data collection facilities (specifically, Recommendations 5, 6, 8, 9, 10, 11, 12, 13, and 274) are of major importance. Failing any immediate action in this regard, a first step would be publication of the distributions of final marks for each course each year within the present framework of reporting procedures of the Department. However, until even such minimal services are made routinely available to the schools, the data presented in this paper represents the best reference against which a mark reported on an Alberta high school transcript can be evaluated.

REFERENCES

Annual Reports of the Department of Education of the Province of Alberta, 1956, 1957, 1958, Edmonton: Queen's Printer.

Connant, James B., *The American High School Today: A First Report to Interested Citizens.* New York: McGraw-Hill Book Company, Inc., 1959.

Mollenkoph, W. G. and S. D. Melville, "Relationships of School, Parent, and Community Characteristics to Performance on Aptitude and Achievement Tests." *The American Psychologist*: 10:8, 447-448, August, 1955.

Report of the Royal Commission on Education in Alberta, Senator Donald Cameron, Chairman, Edmonton: Queen's Printer, 1959.

SOME ADMINISTRATIVE PROBLEMS ASSOCIATED WITH LITERACY WORK IN ETHIOPIA

JEAN ROBERTSON
Edmonton Public Schools
Ehmonton, Alberta

Illiteracy is one of the problems facing the ancient, independent kingdom of Ethiopia today. At mid-century the United Nations Education, Scientific and Cultural Organization (Unesco) estimated the illiteracy rate in Ethiopia for those fifty years and over to be ninety-five to ninety-nine per cent (13, pp. 15, 38). In an estimated total population of sixteen million, Ethiopian school children number about two million. Of these children approximately ten per cent are being reached at some educational level (12, p. 2). Ninety per cent of the school age Ethiopian children, therefore, are illiterate.

Rapid world developments in the sciences, and tensions in the middle east political situation, have brought the problem of eradication of illiteracy into a place of major importance in Ethiopia. The country has been drawn into closer touch with the civilizations of the world by the tremendous advances in transportation and communication in the past twenty years. Some of the African nations close to Ethiopia have gained their independence and others will be self-governing soon. These nations have common racial and religious interests with some Ethiopian citizens and are pressing for political unity with them. Therefore, to maintain its independence as a country and to strengthen its national unity Ethiopia must have citizens who are able to communicate effectively with one another and with the outside world. Reading and writing, the core of the problem of illiteracy, are essential to this effective communication.

The Problem

The problem of the study reported here (9) was to identify and examine some of the administrative problems associated with literacy work in Ethiopia, and to suggest possible ways of attacking them. A literate was defined as one "who can both read with understanding and write a short simple statement on his everyday life" (10, p.5). Literacy was conceived as the means to a wider end, not the end itself (2, p.10). The end could be any avenue of human welfare, social progress and democratic growth (3. p.9).

Two areas of investigation were chosen for the study. One area was the Imperial Ethiopian Government's Ten-Year Plan for the Controlled Expansion of Ethiopian Education and the other, an ex-

amination of the Ethiopian situation in which literacy work is administered. From an analysis of these two areas an answer to the problem of this study was sought.

In the past, literacy work in Ethiopia has progressed very slowly with most of the effort confined to the regular school programme. The purpose of the Ten-Year Plan is to reach the illiterate more quickly with the skills of reading and writing while limiting the expansion of post-literacy programmes.

Ethiopia has been called a "country of great diversity, in its topography, in its climate, and in its peoples, languages, and customs" (7, p.24). The complex situations which develop from such diversity make any study of Ethiopia complicated and difficult as "everything stated can be contradicted either because the opposite is also true of some region or some aspect of the subject or because the truth is not known" (8, xii). It was considered probable that the administration of literacy work would be influenced by these complex situations.

The Data

In the conduct of the study reports from Ethiopia and some other under-developed countries were reviewed.

For the references to Ethiopia, official publications were secured directly from the Imperial Ethiopian Ministry of Education and from other government departments in Addis Ababa, the capital of Ethiopia. A series of three education reports provided the main sources of information in reviewing the Ethiopian educational situation. These reports were the work of the Long-Term Planning Committee established in Hedar, 1946 E.C.* by the Vice-Minister of Education in Ethiopia. The Committee was composed of Ministry of Educational personnel (Ethiopian) and advisory staff (Foreign). Its task was to make a comprehensive survey of the existing school system, and to make "recommendations as to possible reorganization and desirable developments" (12, p.3). The first report of this Committee consisted of basic recommendations for reorganization and development of education in Ethiopia, and the second report proposed the content of the basic school programme. "A Ten-Year Plan for the Controlled Expansion of Ethiopian Education", the third report, was submitted to the Imperial Ethiopian Government in June, 1955. Private publications of those interested in writing about this country were also used.

The literacy programmes of some other under-developed countries were reviewed in an attempt to find common administrative

*This date corresponds to November, 1953 in the Western Calendar. E.C. means Ethiopian Calendar. The Ethiopian year begins on September tenth and is divided into twelve months of thirty days each, the remaining five or six days being gathered together after the twleve months in a small unit of time called "Paugme".

problems whose solutions could be of profit to Ethiopian literacy programs. Unesco publications provided the main source of information.

The Ethiopian Situation

The analysis of the Ethiopian situation in which literacy work is administered was reported (1) as a brief general view of the nation, and (2) as a more detailed consideration of factors which could influence the administration. The composite review emphasized the geography, history, and economic conditions of Ethiopia, the people, their government, and their educational system. This review provided a factual background essential to the understanding of the more detailed analysis of the factors. The five factors considered were (1) economic, (2) educational, (3) individual personal, (4) political, and (5) sociological.

For the convenience of the reader to whom information about Ethiopia may not be readily available the location and landforms of the country together with a few findings from the study of the situation are noted here.

The geographical location of Ethiopia and the East African countries which border it was shown in Figure 1. Figure 2 (1, p.112) shows the landforms with the Rift Valley cutting a path south-west through the great mountainous plateaus. These plateaus have earned the title of "mountain fortress" for Ethiopia (8, p.4). The existence of desert or semi-desert land on almost all sides of the plateaus has given a "double isolation" to the country (8, p.5). Heavy tropical rains in the mountainous plateaus form many rivers which because of the tilt of most of the highlands to the north-west, find their way to the White Nile river.

Diversity appeared to be one of the characteristics of the Ethiopian situation. In a country approximately one and one-half times as large as Alberta, more than one hundred tribes and races live and speak one or more of fifty different languages. The heavy tropical rains in the mountainous plateaus virtually cut off communication for four or five months of the year while in the hot dry regions of the desert, the people are forced to move constantly to find sufficient water for their daily needs. Unlike in customs and frequently surrounded by very different landforms, the tribes often have very little in common with each other.

Another characteristic of the Ethiopian situation was isolation. Protected by the deserts and mountains, Ethiopia has had little contact with surrounding nations until comparatively recent times. Within the country itself, different peoples were isolated from one another and a succession of wars were fought for possession of various sections of the country. The first semblance of political unity

Figure 1.
Location map of Ethiopia

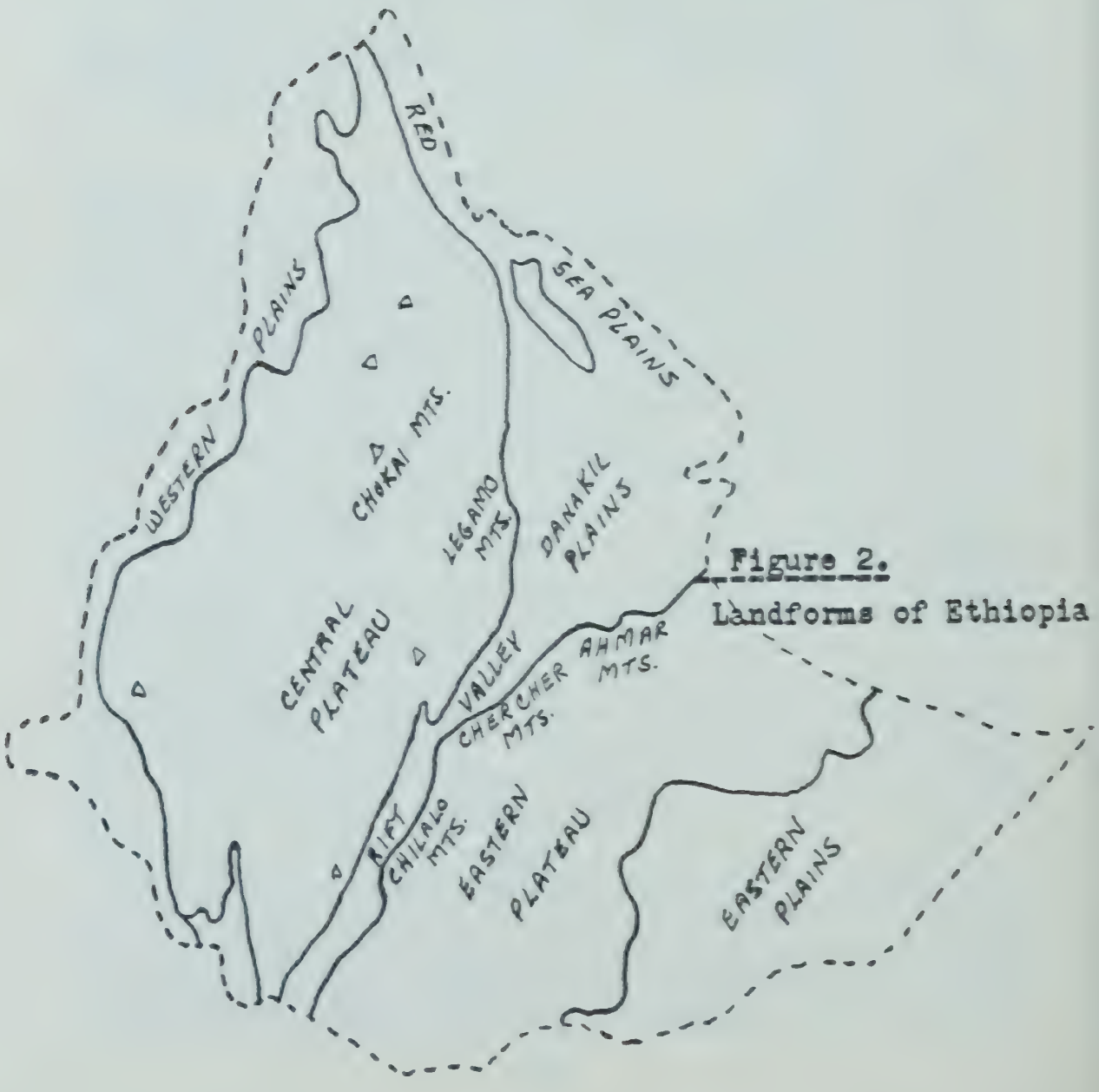


Figure 2.
Landforms of Ethiopia

was achieved by Emperor Menelik in the closing years of the nineteenth century.

The independence of the Ethiopian people was revealed in the investigation. Many centuries of isolation have made the tribes independent of each other, and the nation too has been independent of the world outside its national boundaries. Not until Italy invaded the country in 1935-36 was Ethiopia conquered by an invader.

The present government administration was found to be highly centralized. The Ethiopian government was described as a constitutional monarchy as His Imperial Majesty has invited the Ethiopians to share constitutional authority with him (1, p.20). Each of the twelve provinces had a governor and other officials, all appointed by the Emperor (1, pp. 20-21). For the education work, each province had a Provincial Education Board appointed by the Emperor and a provincial education officer appointed by the Ministry of Education, the department of the central government which administers education. Four regional education officers have been appointed recently. Each officer is to work with three provinces in facilitating collaboration between provincial and central governments (6, p. 152).

Although the first Ethiopian general election was held in 1957 to elect a Chamber of Deputies, neither this body nor the Senate, which is appointed by His Imperial Majesty, determined education policy. This task was performed instead by a National Board of Education appointed by the Emperor and composed of outstanding Ethiopians in public life (1, pp. 21, 28-29).

The financial burden of education was reported as divided between the provinces and the central administration. Elementary education in each province was financed from the proceeds of a special education land tax, but elementary education in Addis Ababa and secondary and higher education throughout the country was supported from the national treasury (11, p.160). This land tax varied according to the land's assessed fertility and was not uniform throughout the country. "There was also a tax on cattle and other livestock, at fixed rates per animal, payable by the nomadic population who do not pay land tax" (7, pp. 61-62).

> As the tax is based upon the ownership of land, most town-dwellers are exempt from any direct contribution for educational expenses though their children benefit fully from local schools. Moreover, as the income from the tax varies considerably from province to province, there has grown up an inequality of educational opportunity which is likely to become more and more marked with the passage of time (11, p. 160).

The selection of the language of literacy produced one of the most difficult problems associated with literacy work. Amharic, the only official Ethiopian language of literacy, is the language of the

Amharas, the ruling tribe of which His Imperial Majesty is a member. As Amharas are said to number only about one-third of the total population (7, p. 25), approximately two-thirds of the people must become literate in a language which is not their mother tongue.

Two factors of particular significance to literacy work in Ethiopia appeared from the analysis of the Ethiopian situation. They were the language and the time problems.

Official Ethiopian reports confirmed that "the language problem is the basic problem in Ethiopian education" (11, p.88). The Amharic language is difficult to learn and linguistic problems of great magnitude face the Ethiopian school administrators. Gunther termed the Amharic alphabet "fantastic" (4, p. 261), and the Guide Book of Ethiopia listed "33 basic letters of which there are 231 modifications, indicating the different following vowels (1. p. 69)." The complexity of the problem of teaching this language as a second language to the majority of the nation cannot be overemphasized. Each non-Amhara student is faced with a double learning burden. He must first master the Amharic language and then acquire the skill of literacy in it.

The dilemma of time was revealed as one of the foremost problems facing administrators of literacy work in Ethiopia. To make a country literate requires many years. The educational systems of modern countries have developed gradually with a corresponding development of the economy of each country. Ethiopia however, in its urgent need to consolidate and maintain its national unity is demanding a literate nation far in advance of a corresponding economic development.

The Ten-Year Plan

In the investigation it was found that the Ten-Year Plan was inseparably linked with the past history of Ethiopia. Through classes conducted by the priests, the Ethiopian church provided the chief means of formal education. At the turn of the century government schools were established and the government school system developed until the Italian invasion of 1936. After the Emperor returned to Ethiopia in 1941, a new start had to be made and the most pressing need was for administrators, technicians, and professional personnel. The result was a rapid development of the secondary and higher education institutions without a corresponding development in the elementary school system. Meanwhile the academic programme of the elementary school was not adapted often to the daily life of the student, and this resulted in a heavy drop out. The first term enrolment figures for 1956-57 as issued by the Ministry of Education showed a drop out of 79 per cent of the students from grade one to four (5). However, once the need for ad-

ministrators had been met the attention of the government turned to the needs of the masses for a programme which would aim to make literacy the means to a better life and not the end in itself.

The Ten-Year Plan, covering the period 1956-57 to 1965-66, is to provide facilities for the masses to become literate. Thirty-five community schools will begin operation, with ten schools of this number to be previously-established primary schools converted into community schools. The community school is to be the centre of literacy work among children and adults in the area. The programme is to be practical and adaptable to the needs of the people. Government trained and paid teachers and leaders are to conduct the work in buildings built and maintained by the community which it serves (11). Some of the graduates of these schools (grade one to four) will go on through middle schools (grade five to eight) and secondary schools but the majority will be encouraged to attend vocational schools after completing the community school programme. No official progress reports are available but several unofficial sources stated that the establishment of community schools is behind the schedule set out in the Ten-Year Plan.

Results

Seven important problems in the administration of literacy work in Ethiopia were identified and examined in this study. One of these problems is policy formulation. The Ethiopians are being asked to support and aid in the implementation of government literacy policies. The large majority of the people, however, have had no voice in formulating these policies.

The high drop out rate among Ethiopian children in the first four years of primary school represents a serious loss of educational resources posing the use of these resources as another administrative problem.

A problem of communication exists because of the geographic and climatic conditions, the diversity of languages, and the highly centralized governmental organization. These same factors have prevented the Ethiopian government from providing its people with many opportunities to participate in the planning and carrying out of community projects. Many Ethiopians, therefore, are neither willing nor able to accept responsibility for such projects and their participation in the educational programme is a problem for the administrator.

The educational programmes offered by the Ethiopians have not been acceptable to all the people and changes are necessary. How to initiate these changes is a difficulty which an administrator faces.

Both the coordination of literacy work with other parts of the

community school programmes, and the coordination of the various aspects of the literacy programme itself are important phases of the problem of coordination.

Because Ethiopian education has not always been adequately evaluated, how to make evaluation more effective is a problem.

Commendable Practices and Proposals

A number of worth-while practices and proposals for further improvements in Ethiopian educational programmes were considered particularly commendable.

The community school progamme itself as presently proposed is commendable because it is designed to meet the literacy needs of the masses. In addition provision is made for the government to direct and control the growth of more advanced schools.

The policy of promoting Ahmaric as the official national language of Ethiopia is sound. When the Ethiopians are able to discuss their problems together in the same language, they will understand the problems better.

One of the provisions of the Ten-Year Plan was the appointment of bilingual teachers to help non-Amharic speaking students learn the national language. This is commendable as these teachers are able to explain differences and similarities between the vernacular and Ahmaric and thus establish a desirable contact between the two languages.

The increased delegation of responsibility and authority to educational officials in the provinces is commendable. Business of the educational programme can be completed faster in the provinces when educational officials there have the authority to make the necessary decisions.

Recommendations

The establishment of additional channels of communication between the Ethiopian people and their education officials would provide the people with more opportunities to help in the planning of projects. This could be accomplished by giving the Chamber of Deputies a voice in the formulation of educational policies, and by establishing better channels of communication between the Deputies and the districts they represent. Advisory boards for the community schools could be set up composed of adults who are elected by the people of the community which the school serves.

To help solve the language problem the extension of the power of Radio Addis Ababa to reach all parts of the Empire and the installation of a network of public receiving sets is recommended. This action would ensure an opportunity for the people to hear Amharic regularly. New literates then would be encouraged to

speak and read Amharic more often. The publication of a weekly newspaper in simple Amharic would promote interest in reading among the new literates. Interest too in Ethiopian life in many parts of the Empire would be stimulated by the newspaper. The increased use of bilingual teachers in all non-Ahmaric speaking areas would speed the learning of Ahmaric in these areas.

The extension of advisory services to Ethiopian teachers in community schools would provide the teachers with more help, encouragement, and stimulation. This extension might be accomplished through the frequent visits of the supervisors to the schools and the establishment of short refresher courses. In addition, the establishment of provincial organizations for Ethiopian teachers and the organization of field trips for teachers to centres where the community school programme is being successfully carried on, are recommended.

To facilitate the coordination of various parts of the community school programme the organization of advisory groups at the national, provincial, and local levels is recommended. At the national level an inter-ministerial committee would ensure prompt attention to educational matters of mutual interest. The Ministries of Education, Health and Agriculture would be three of those represented on this committee. Inter-ministerial committees in the provincial capitals should be composed of representatives from the ministries participating in the community school programme. Local school boards as recommended above would help to coordinate community school activities with those of the community.

The establishment of a plan to enable experts and specialists from foreign countries to continue their work in Ethiopia for longer periods of time would give more continuity to the community school programme. Joint action by the Ethiopian government and the foreign governments concerned would be required for the establishment of such a plan.

In each recommendation two factors appeared to be particularly important in achieving a solution for the administrative problems. One factor was the need for wise leadership and understanding among Ethiopian nationals and foreign advisers in their work with the illiterates. The other factor was the willingness of the illiterates to be led into new ways of life. During the past decade the Ethiopian people have made significant educational advances under the able leadership of the Emperor, Haile Selassie the First. It is hoped even greater advances may be made during the coming decade.

REFERENCES

1. Chamber of Commerce. *Guide Book of Ethiopia.* Addis Ababa: Berhanenna Salem Printing Press, 1954.

2. *Fundamental Education, A Description and Programme.* Monograph on Fundamental Education, Number 1. Paris: Unesco, 1949.
3. Gray, William S. *The Teaching of Reading and Writing.* Monograph on Fundamental Education, Number X. Chicago: Scott, Foresman and Company. 1956.
4. Gunther, John. *Inside Africa.* New York: Harper and Brothers, 1955.
5. Imperial Ethiopian Ministry of Education. *First Term Enrollment Figures for Government Schools.* 1950 E.C. [1957]
6. *International Yearbook of Education.* Paris: Unesco. Vol. XIX. Publication No. 190. 1957.
7. Luther, Ernest W. *Ethiopia Today.* Stanford: Stanford University Press, 1958.
8. Perham, Margery. *The Government of Ethiopia.* London: Faber and Faber Limited, 1958.
9. Robertson, Jean E. "Some Administrative Problems Associated with Literacy Work in Ethiopia." Unpublished Master's thesis, University of Alberta, 1960.
10. "The Definition and Measurement of Literacy." *Fundamental and Adult Education.* Paris: Unesco. Vol. IX. No. 1. pp. 3-8. January, 1957.
11. The Long-Term Planning Committee of the Imperial Ethiopian Government. *A Ten-Year Plan for the Controlled Expansion of Ethiopian Education.* Addis Ababa: Ethiopian-United States Cooperative Education Press, 1947 E.C. (June 1955).
12. The Long-Term Planning Committee for Ethiopian Education. *Basic Recommendations for the Reorganization and Development of Education in Ethiopia.* Addis Ababa: 1947 E.C. (July 1955). Mimeographed.
13. *World Literacy at Mid-Century.* Monograph on Fundamental Education, Number XI. Paris: Unesco, 1957.

AN EVALUATION OF AN EXPERIMENTAL METHOD OF TEACHING LANGUAGE TO LOW ABILITY GRADE X STUDENTS

HOWARD L. LARSON, DONALD B. BLACK
AND
M. PATRICIA BROWNE

A finding of the Alberta Five School Study was that fifty-eight percent of the students from these schools who were, for the most part, low achievers, failed to complete a high school diploma (Larson, 1958). While this finding suggested a degree of homogeneity of ability of the student body, the evidence pointed to the reverse condition. To the investigators, it seemed evident that the schools concerned were geared only for university preparation particularly in the compulsory subjects, such as language. Students who could not meet these conditions left the schools without a diploma to find employment as best they might. The question arose as to whether or not the schools were releasing into the community large numbers of semi-illiterate youngsters with Grade X and XI education.

Since the completion of this dropout study, societal pressures occasioned in part by a declining economy have resulted in students remaining in school longer. This has had the direct effect of further aggravating the problem of meeting individual differences in the classroom, and in fact, this has been accentuated by the communities, directly or indirectly, insisting that students remain in school until they obtain a full high school diploma.

Forced to meet this problem, the Five School Study Committee elected to concentrate on language and literature study at the Grade X level.*

A program of modified streaming was used to group low ability students into special classes. This grouping was further strengthened by the provision of a special curriculum in language study. This study, then, reports the evaluation of this experimental program.

---

*This language experiment was truly a group effort. The groundwork was laid by the Five School Project Study in Central Alberta. The details were planned by a committee of three members and four language teachers. The principals of eight regional high schools administered the tests. The Department of Education provided the tests and did all scoring. A group of three Edmonton teachers provided much valuable information from their experience with low achievement groups in that city. Four principals from Vegreville, Fort Saskatchewan, Stettler, and Wetaskiwin, co-operated in providing control schools. Four principals who were members, from Leduc, Camrose, Lacombe and Ponoka, together with their teachers, did the experimental work and obtained the material for teaching. The University of Alberta, Faculty of Education, provided further the professional assistance. Even the final draft was a committee effort.

Sample

Inasmuch as the five schools of the Study Group were sufficiently large, Grade X entering students were grouped into low ability classes according to the following criteria:

(1) All students had a stanine score of four or lower on the Grade IX Departmental Language Test, Reading Test and the Verbal Section of the General Test.

(2) Class size in each school was to be kept between twenty and twenty-five students.

(3) When insufficient students were found to make a class of sufficient size, students with low Language and Reading stanine scores but who had Verbal scores of stanine 5 on the General Test were added to make up the required number.

Of the five Study Group schools, one school was unable to participate because of timetable problems for the special classes. This particular school was dropped from the experimental group. Because it was teaching a conventional Grade X language program with no grouping procedures in force, it was included with three other schools of similar size from the general area, also teaching a conventional language program, to serve as a control group for this study. The schools teaching the experimental program will be referred to in this paper as the experimental group consisting of schools X_1, X_2, X_3, and X_4. Similarly, the four schools teaching a conventional program (C_1, C_2, C_3, and C_4) will be referred to as the control group.

Three tests were chosen from the Iowa Tests of Educational Development battery as the most likely to assess the skills and understandings sought in the Grade X language program. The three tests were Correctness and Appropriateness of Expression (referred to hereafter as the Correctness of Expression Test), Interpretation of Literary Material, and General Vocabulary. Further testing was restricted by the amount of testing time made available to the Committee. It is a assumption of this study that the tests, first, measure those skills sought after in the language programs, and second, that each student's performance as measured by the reported test score truly reflects his mastery of these skills and understandings.

The tests themselves were administered to all Grade X students in the fall of 1959 and the alternate forms in May 1960. All raw scores were converted to a single scale score using the publisher's norms. From the results of the initial testing, the Five School Study Committee selected matched groups from the control schools. As a result of this testing, and after excluding dropouts and students

who missed one or more test administration, seventy-three pupils from each of the control and experimental groups participated in the study.

Experimental Method

As noted earlier, a special curriculum, teaching method, and materials were provided for the experimental group. For the purposes of this study these will be referred to together as the "experimental method". In the control schools, no homogeneous grouping of students was attempted and no changes were made from the regular curriculum and method of teaching language and literature in Grade X.

The curriculum of the experimental method was directed by the following aims and principles: *

The Aims

To develop and improve reading comprehension, facility of written and oral expression, reading habits, organization of information, and vocabulary building.

Guiding Principles

In place of the unit method of presenting materials, the teacher committee decided to vary the method from day to day on a weekly schedule. Much stress was given to organizational routine. Chapters 3, 4 and 6 of the authorized text were stressed — others omitted in whole or in part. Literature selections appropriate only to the low achievers were used. Precise reasons for students being grouped were stressed to parents. Literature and language periods were scheduled consecutively. Teachers of the experimental groups taught both the language and literature. Finally, no attempt was made to "force" students to reach certain objectives — rather each was encouraged to measure his own progress. The S.R.A. reading laboratory and various quick tests from the magazines aided both student and teacher in evaluating progress.

The selection of books and materials for the experimental method owes much to three language teachers from the City of Edmonton schools. These particular city schools had formulated a plan for teaching low language achievers a year prior, but had made no effort to evaluate experimentally the results of their program. As a result of these recommendations and on the advice of the four teachers who conducted the experimental classes, each student in the experimental group was required to obtain:

(1) A subscription to each of Practical English and Literary Cavalcade (both published by Scholastic Magazines, New York)
(2) English for Today X — regular course text (Gray et al.. authors, Longmans, Green and Company, Toronto)
(3) Creative Living, Book IV (M. M. Boyd, W. J. Gage and Company, Toronto)
(4) Thorndike-Barnhart High School Dictionary (Scott Foresman and Company, Chicago)

*Quoted directly from correspondence of the Five School Study Committee to the schools regarding the project.

For each experimental classroom, the following special primary references were procured:

(1) Writing With a Purpose: Books I and II (Bassett and Rutledge, Row Peterson and Company, Evanston, Ill.)
(2) English Workshop, Grade 10 (Blumenthol and Warringer, Harcourt Brace and Company, Chicago)
(3) Practical English Workbook (published by Scholastic Magazines, New York)
(4) SRA Reading Laboratory: Secondary Edition (Parker, Science Research Associates, Chicago)

In addition to the above, many other secondary references were made routinely available.

Findings

The analysis of the data centered about the testing of three hypotheses:

(1) In terms of the seven initial matching and pre-testing variables, there were no differences between the control and experimental groups.
(2) Both the control and experimental group would show significant gains in performance on the three Iowa tests over the experimental period.
(3) The experimental group would perform significantly better at the end of the experimental period than would the control group at the end of the same period.

To test the above hypotheses for each of the three variables, the means and standard deviations for both the pre-test and post-test score variables were calculated and are reported in Table I. Further, because of the correction factor necessary in performing "t" tests when the pre- and post-test scores are related, the correlation coefficients between pre- and post-test scores were calculated for each variable and for each group. Statistical tests for mean differences using the conventional "t' test for data of this kind were then performed. (Table II). To test Hypotheses 2 and 3, one tailed tests of significance were used. Summaries of these analyses are reported in Table III:

These results reveal the following:

(a) In terms of the seven pre-test variables only one significant difference between the control and experimental group was found. This difference was in the Language test score which favored the control group and which was significant at the five percent level of confidence. The first hypothesis was accepted only on the qualification that the two groups differed in initial reading ability.
(b) The second hypothesis, that of the post-testing scores being significantly higher than the pre-testing scores on the three Iowa tests, was accepted at the one percent level of confidence. Both groups showed statistically significant gains in performance over the experimental period.
(c) The third hypothesis, specifically that in terms of final performance, the experimental group would exceed the control was accepted at the one percent level of confidence for only the Iowa Correctness of Expression variable. Differences in the other two variables were not found to be significant. It is noted, however, that in the case of the Iowa General Vocabulary Score the performance of the control group did exceed that of the experimental group.

TABLE I

SUMMARY OF MEANS AND STANDARD DEVIATIONS FOR SEVEN VARIABLES FOR PRE- AND POST-TESTING OF CONTROL AND EXPERIMENTAL GROUPS

Variable		Control Group (N=73)		Experimental Group (N=73)	
		Pre-Test	Post-Test	Pre-Test	Post-Test
Age (months)	M	190.17	—	192.95	—
	S.D.	10.00	—	9.52	—
Grade IX Departmental Language Score	M	3.64	—	3.29	—
	S.D.	.80	—	.89	—
Departmental Reading Score	M	4.59	—	4.49	—
	S.D.	.76	—	.79	
Departmental General Test Verbal Score	M	3.30	—	3.16	—
	S.D.	.77	—	.81	—
Iowa: Correctness of Expression Score	M	12.04	13.33	12.64	14.47
	S.D.	3.05	3.49	2.53	2.14
Iowa: Interpretation of Literary Material Score	M	10.36	10.53	10.36	11.36
	S.D.	3.84	3.56	3.67	4.38
Iowa: General Vocabulary Score	M	12.11	12.62	11.14	12.52
	S.D.	3.01	3.26	3.62	3.80

TABLE II

CORRELATION BETWEEN PRE- AND POST-TESTING SCORES FOR CONTROL AND EXPERIMENTAL GROUPS AND SIGNIFICANCE OF DIFFERENCE BETWEEN THESE RELATIONSHIPS

Hypothesis		Control Group	Experimental Group	Significance of Difference
The Experimental Group will show less relationship between pre- and post-test scores than will the Control Group	Iowa: Correctness of Expression	.72	.48	1%
	Iowa: Interpretation of Literary Material	.44	.75	(—1%)
	Iowa: General Vocabulary	.61	.74	N.S.D.

TABLE III

SUMMARY OF TESTING OF HYPOTHESES FOR FULL EXPERIMENTAL AND CONTROL GROUPS INDICATING LEVEL OF CONFIDENCE

Hypothesis Tested	Age	Grade IX Departmental Lang. Score	Departmental Raeding Score	Departmental Gen. Test Verbal Score	Iowa Correctness of Expression Score	Interpret. of Literary Material Score	General Vocabulary Score
No Significant Difference Between Control and Experimental Group Before Experiment	N.S.D.	5% Favoring Conrol Group	N.S.D.	N.S.D.	N.S.D.	N.S.D.	N.S.D.
Control Group Will Have Significantly Higher Scores at Conclusion of Experimental Period	—	—	—	—	1%	1%	1%
Experimental Group Will Show Significant Improvement at End of Experimental Period	—	—	—	—	1%	1%	1%
Experimental Group Will Perform Significantly Better Than Control Group at End of Experiment	—	—	—	—	1%	N.S.D.	N.S.D.

A fourth hypothesis was also tested. It was reasoned that, due to the nature of the experimental method, a lower relationship would be found between pre- and post-test scores on the three score variables for the experimental group than that for the control groups. Using the conventional one-tailed test for significance of difference between two correlation co-efficients, it was found that the above hypothesis could only be accepted for the Iowa Correctness of Expression test score variable (at 1% level of confidence). Moreover, it would appear that the converse hypothesis would have been more appropriate (at the 1% level of confidence) for the Interpretation of Literary Material test score variable.

In conclusion, the analysis of the data would suggest that the experimental method did nothing to improve performance in langu-

TABLE IV

SUMMARY OF MEAN AND STANDARD DEVIATIONS OF PRE- AND POST-TESTING ON THREE TESTS BY SCHOOL AND GROUP

Test Variable	Group	Statistic	SCHOOL 1 Pre	SCHOOL 1 Post	SCHOOL 2 Pre	SCHOOL 2 Post	SCHOOL 3 Pre	SCHOOL 3 Post	SCHOOL 4 Pre	SCHOOL 4 Post	Total Pre	Total Post
Correctness of Expression	Control	M	12.87	12.40	13.11	14.50	13.28	14.72	9.59	11.86	12.04	13.33
		S.D.	2.54	3.91	2.71	2.54	2.23	2.80	2.81	3.58	3.05	3.49
	Experimental	M	12.61	14.72	13.15	14.60	12.35	14.00	12.40	14.60	12.64	14.47
		S.D.	2.11	2.28	3.07	2.31	2.10	1.64	2.60	2.17	2.53	2.14
Interpretation of Literary Material	Control	M	10.47	9.40	10.44	10.72	11.44	11.11	9.36	10.68	10.36	10.53
		S.D.	4.16	2.92	2.36	3.46	3.13	3.37	4.75	3.91	3.84	3.56
	Experimental	M	10.28	10.39	11.11	12.25	9.40	11.10	10.73	11.67	10.36	11.36
		S.D.	4.53	4.36	3.79	4.32	3.84	3.59	3.19	5.15	3.67	4.38
General Vocabulary	Control	M	12.40	11.13	11.72	10.94	12.78	13.61	11.68	14.18	12.11	12.62
		S.D.	2.99	3.79	2.53	2.20	2.99	2.63	3.22	2.96	2.01	3.26
	Experimental	M	10.11	11.83	11.30	12.85	11.45	11.85	11.73	13.80	11.14	12.52
		S.D.	2.94	3.53	3.60	4.09	3.74	3.12	3.96	4.42	3.62	3.86
Size of Sample	Control	N_c	15		18		18		22		73	
	Experimental	N_x	15		20		20		15		73	

age skills over those achieved in conventional classes, other than in those skills measured by the Iowa Correctness of Expression test.

The analysis of data, however, did not end at this point. During the treatment of the foregoing data, the performance of certain of the schools appeared to vary markedly from the general trend. It was reasoned that such differences, if they existed, could have an important bearing on the evaluation of the experimental method. To this end, another series of analyses was undertaken using the conventional single analysis of variance to examine the relative performance of each school. Tests for homogeneity of variance and evaluation of school means used were Bartlett's Test (Edward 1950, p. 198) and Tukey's procedure (Edwards, 1956, p. 330-335).

Means and standard deviations were calculated for each variable and for each school in the central and experimental group for both pre- and post-testings. These data are reported in Table IV.

The first hypothesis tested was that there were no differences between performance of students in each of the eight schools on the seven pre-experimental variables other than those which could be attributed to chance factors in sampling. The result of testing this hypothesis is reported in Table V. The results show that the hypothesis is accepted for all but two of the variables, STEP Reading and the Iowa Correctness of Expression test scores. In all instances the test for homogeneity of variance of the schools was accepted. In the analysis of means using Tukey's procedure, it was established that the school means for the Reading variable fell into three groups: a low group with a school from both the control and experimental group, a middle group with three schools from the experimental group and one from the control group, and a high group with two schools from the control group. It is clearly indicated that on the Reading score variable any advantage to be gained must lie with the control group. From the analysis of the Iowa Correctness of Expression pre-test scores, no differences in performance were found between seven of the schools, but one school (C_4) from the control group performed significantly lower than the others. In summary, it would appear that any assumption of the equality of initial performance of the schools in the interpretation of later results could only be accepted with reservation and particularly when the experimental variables involve skills associated with those measured by the STEP Reading Test.

It was evident that in light of possible differences in initial levels of performance, a more valid evaluation of the effectiveness of the experimental teaching method could be determined by examining score gains between the post- and pre-testing. To this end, the score differences between the two testings for each student for

TABLE V

RESULTS OF TESTING HYPOTHESIS THAT SCHOOLS CHOSEN FOR CONTROL AND EXPERIMENTAL GROUPS HAVE BEEN CHOSEN AT RANDOM FROM THE SAME GRADE X POPULATION

Variable	F Test	Test for Homogenity of Variance	Summary of Significant Differences in Analysis of Ranked Means (Tukey's procedure using the 5% level of confidence for significance of of difference)
Age	N.S.D.	.....	.....
Departmental Language Score	N.S.D.	.....	.....
Departmental Reading Score	5%	N.S.D.	(C_2X_2) $(X_2X_4X_3C_4)$ (C_3C_1)
Departmental General Test "V" Score	N.S.D.	.....	.....
Iowa Correctness of Expression Score	1%	N.S.D.	C_4 M is significantly lower than rest of group
Iowa Interpretation of Literary Material Score	N.S.D.	.....	.....
Iowa General Vocabulary Score	N.S.D.	.....	.....

the three Iowa tests were calculated, a positive difference indicating a score gain; a negative difference, a loss. The mean and standard deviations of the individual student's gains were calculated for each school and for the total group, both the control and experimental, for all three test score variables. These statistics are reported in Table VI.

The first hypothesis tested using these latter data was that the mean gain shown by the experimental group would be greater than that shown by the control group. This hypothesis was accepted at the five percent level of confidence for only the General Vocabulary variable.

TABLE VI

MEANS AND STANDARD DEVIATIONS OF THE DIFFERENCES BETWEEN PRE- AND POST-TESTING SCORES OF INDIVIDUALS IN CONTROL AND EXPERIMENTAL CLASSES FOR THREE TEST SCORE VARIABLES

Variable	Group	Statistic	SCHOOL 1	2	3	4	Total
Correctness of Expression	Control	M	—0.47	1.38	1.44	2.27	1.28[1]
		S.D.	2.35	2.61	2.09	3.25	2.83
	Experimental	M	2.11	1.45	1.65	2.20	1.82[1]
		S.D.	2.05	2.48	1.93	3.10	2.41
Interpretation of Literary Material	Control	M	1.00	0.27	— .34	1.31	0.17[1]
		S.D.	2.92	3.33	3.76	4.26	3.76
	Experimental	M	0.11	1.15	1.70	0.93	1.00[1]
		S.D.	2.92	2.63	2.92	3.15	2.95
General Vocabulary	Control	M	—1.27	— .78	0.83	2.50	0.50[2]
		S.D.	2.23	2.74	2.09	2.13	2.76
	Experimental	M	1.72	1.55	.40	2.07	1.38[2]
		S.D.	2.23	2.06	2.56	3.66	2.71

[1]Mean Difference between Control and Experimental Group not significant.
[2]Mean Difference between Control and Experimental Group significant at 5% level of confidence.

An examination of Table VI reveals some spectacular gains (and losses) for certain of the schools. As before, the question arose regarding the uniformity of gains or losses within the school comprising the control and experimental groups. A hypothesis was established that any differences in gain performance between any of the schools in the control and the experimental groups could be attributed to chance factors. This hypothesis was tested for each of the three Iowa test score variables for each of the two groups using the analysis of variance procedure outlined earlier. The results of this analysis are reported in Table VII.

This analysis revealed that the hypothesis was accepted for the three test variables for the experimental group. For the control group, however, the hypothesis was accepted only for the Iowa Interpretation of Literary Material variable. For the other two variables, School C_1 gains were found to be significantly lower than the other three schools; in fact C_1 students achieved poorer

TABLE VII

RESULTS OF TESTING THE HYPOTHESIS THAT THERE ARE NO DIFFERENCES IN MEAN GAINS BETWEEN SCHOOLS IN THE CONTROL AND EXPERIMENTAL GROUPS

Variable	Group	F Test	Test for Homogenity	Summary of Means of Analysis
Correctness of Expression	Control Experimental	5% N.S.D.	N.S.D.	C_1 (low) and C_4 (high)
Interpretation of Literary Material	Control Exeprimental	N.S.D. N.S.D.	....	
General Vocabulary	Control Experimental	1% N.S.D.	N.S.D.	C_4 Straggler (Striking gains)

scores as a group on the second testing than they did on the first. School C_4, on these two variables, however, showed striking gains significantly superior to the other schools of the control group.

Referring back to Table VI, it would appear that School C_4 has an enviable record as far as gains in performance from pre- to post-testing were concerned inasmuch as the gains made by this class in every instance exceeded those made by the other seven classes. This may be put in proper perspective by re-examining Table IV. In every instance, School C_4 had the lowest mean pretest performance on the three Iowa tests for the control group and, with one exception, C_4's performance ranked below that of the four experimental schools as well. Only in the Iowa General Vocabulary test did C_4's pre-test mean exceed other schools (X_1, X_2, X_3). On the post testing, C_4 only ranked first on the General Vocabulary among the control group school as compared to a ranking of 4 and 3 on the other two variables. It seems apparent that for some reason C_4 was a weak class to begin with and it remained a weak class at the end of the experiment. The only difference is that during the experimental period this class had made marked gains in reducing the gap between this class and the others. Conversely, School C_1's performance is marked by two performance losses while making a sizable gain on the Interpretation of Literary test performance.

The final hypothesis evaluating the effectivness of the experimental method was set up from Table VI on the basis of direction of gain in performance from pre- to post-testing performance. It stated

that the direction of gain for every school within each group would be positive; i.e., the mean gain scores would be positive for each school. Using the non-parametric Sign Test (Siegel, 1956 pp. 68-72), it was found that in each instance for the three test score variables, the experimental schools showed a consistent positive gain which permitted acceptance of the hypothesis for this group at the five percent level of confidence in each case. Using the performance of the four experimental schools on all of the three test score variables, the hypothesis was accepted at the one percent level. In every instance whether for each test score variable or for the total twelve mean gain scores, the hypothesis was rejected for the control group.

Summary of Findings and Conclusions

Summing up, the difficulty in establishing initial comparability of control and experimental groups necessitated a restriction in the interpretation of results of this study. These inequalities were found in the Grade IX Reading test score variable which showed a bias favoring the control group, and in the Iowa Correctness of Expression test score variable where one of the schools in the control group performed significantly lower than the other seven schools of the study sample. Notwithstanding this latter difference, it was not of sufficient magnitude to result in any significant difference between the total control and experimental groups on this particular variable.

Within the above limitations, the experimental method for the total group was found to be significantly better than the conventional classroom methods in improving scores on the Iowa Correctness of Expression test. There was no difference in performance of the two groups on the other two test score variables. Both the experimental and control groups made significant gains in test score performance from pre- to post-testing. On the basis of this evidence, the experimental method is at least as good, if not better than, the conventional method of teaching Language 10 to low performing Grade X students — and this with an initial handicap favoring the control group.

Further evidence revealed a uniformity of improvement of performance of schools within the experimental group which could be attributed to more precise definition of the curriculum in the experimental classes rather than to any superiority of the method. In any event, each experimental class showed positive and statistically uniform gains in each of the three test variables, a performance the control group failed to achieve.

In conclusion, it is believed that the evidence from this study is such that it suggests the superiority of the experimental method. However, in light of the difficulty encountered in equating the

control and experimental groups, full substantiation of this method as a superior method of teaching slow-performing Grade X students must depend upon further experimental evidence. In any event, this study has at least shown it to be no poorer than conventional methods of teaching the students of this particular ability level. Therefore, for schools seeking uniformity of performance of low language ability students or if the experimental method is found desirable on administrative grounds or by teacher preference, the evidence of this study would recommend its introduction in the school program without learning penalty to the students concerned.

As a final note, it is the intention of the Five School Committee to continue the experimental language course in all schools in the Five School Project area. With some modification in the testing procedures, experimental evidence will be collected for at least the 1960-61 term. Provision will also be made for precise teacher evaluation of the method at the end of this period.

REFERENCES

1. Edwards, Allen L., *Experimental Design in Psychological Research.* New York: Rinehart and Company, Inc. 1950.
2. ..... *Statistical Methods for the Behavioral Sciences.* New York: Rinehart and Company, Inc. 1956.
3. Larson, Howard L., "The Five School Project Dropout Study". *Alberta Journal of Educational Research.* Vol. 14:4, December 1958, pp. 212-215.
4. Siegel, Sidney, *Non-Parametric Statistics for the Behavioral Sciences.* New York: McGraw-Hill Book Company, Inc. 1956.

NONGRADED ELEMENTARY SCHOOL PROGRAMS

R. Cameron Ritchie
Principal, Fulton Place School, Edmonton
and
Walter H. Worth
Faculty of Education, University of Alberta

In recent years there has been a movement in Canada and the United States toward the establishment of nongraded elementary school programs designed to implement a theory of continuous pupil progress. There exists, however, little coordinated resource material which might serve to guide school workers interested in implementing a program of this type. The present article reports briefly on a study[1] which was undertaken in an effort to obtain such information.

Purpose and Procedure

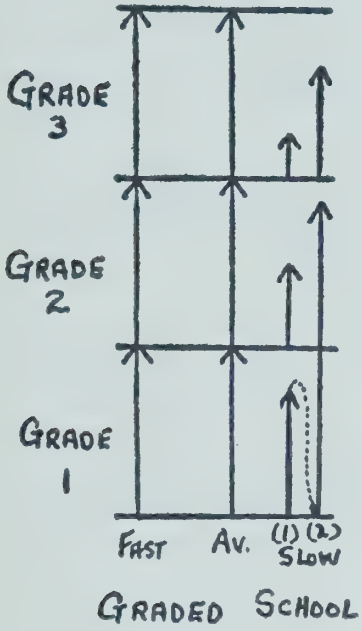
The study sought to appraise the development and operation of selected nongraded elementary school programs in Canada and the United States. The main sources of data were eight Canadian and twenty-two American school systems which had developed, or were in the process of developing, nongraded programs. Materials and information received from these sources were examined, compared, and sorted in order to make possible a description of common practices. Eight dimensions of nongraded elementary school programs were singled out for special analysis. The eight dimensions selected were: pupil classification, pupil selection, pupil grouping, curriculum, pupil evaluation, reporting, promotion practices, and administrative records. These dimensions were considered to be major areas in which modifications of the graded program appeared to be taking place in order to implement the concept of continuous progress underlying nongraded programs.

Program Appraisal

Pupil Classification

The nongraded plan is an administrative system whereby a set of progressive levels, or steps, is substituted for the present grade nomenclature as a means of classifying pupils for instructional purposes. The number of these levels or steps to be completed by each child before he leaves the primary or elementary stage of his education tends to vary from school system to school system. Some of the programs surveyed had as few as eight levels, while other had as many as twenty. Whereas the majority of American centers

FIGURE I
COMPARISON OF CHILDREN'S PROGRESSION IN A TRADITIONAL GRADE SYSTEM AND A NONGRADED SYSTEM

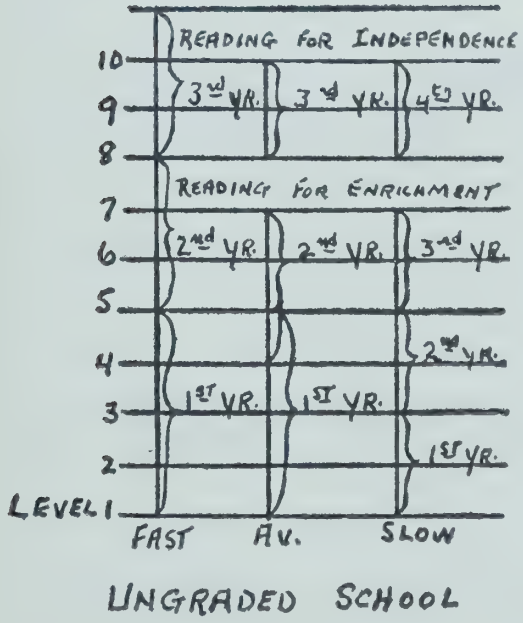


Graded School

Fast Learner—progresses at same rate as average student. Has no chance to achieve more than the others.

Average Learner—does work of grade and passes each year from grade to grade.

Slow Learner—each succeeding year achieves less of his grade's work.
(1) He may be promoted socially, and at the end of three years finds himself behind those of his grade.
(2) He may be held back at the end of the first year thus "repeating" the entire grade. Part of the work he will have learned and thus will have time wasted for him in repeating.



Ungraded School

Fast Learner—has level 7 and 10 to achieve over the average student, thus broadening his reading background and strengthening his reading skills. Will complete Primary school in three years.

Average Learner—will achieve basic reading work in three years without level 7 to 10.

Slow Learner—progresses from the level he achieves to the next level above. There is no "being held back" or "repeating". This child progresses with a feeling of success. At the beginning of the next year he begins where he left off. After a maximum of four years in primary school, the child will be placed in Grade IV.

based their system of levels almost exclusively on reading, most of the Canadian schools also included arithmetic and spelling.

The following plan employed by the Washoe County School District, Reno, Nevada illustrates how pupils are classified on the basis of reading achievement at the primary level:

Level 1 — Reading Readiness
2 — Pre-Primers
3 — Primer

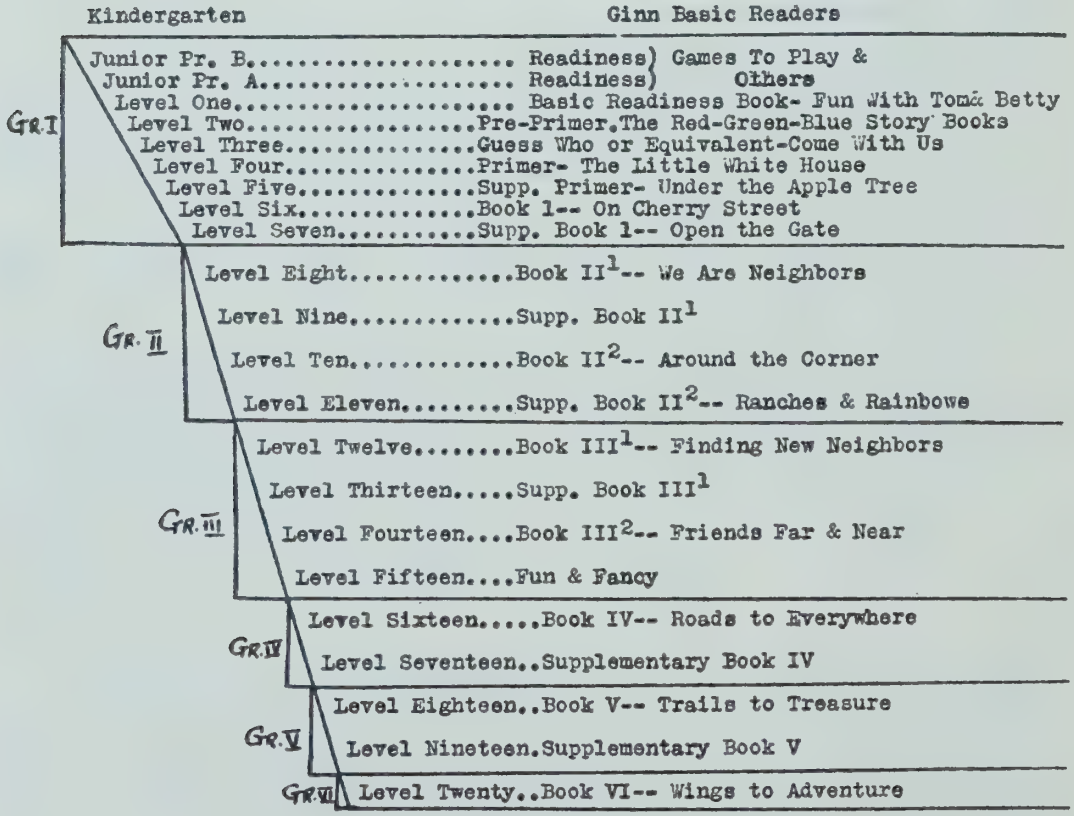
4 — First Reader
5 — Easy Second Reader
6 — Hard Second Reader
7 — Enrichment
8 — Easy Third Reader
9 — Hard Third Reader
10 — Enrichment

The way in which fast, average, and slow learners progress through this type of nongraded program as compared with the traditional graded program is shown in Figure I.

A picture of the way in which pupils may progress through the various reading levels of a six-year program is given in Figure II. In this plan, which is sometimes called the Van Dyke System, all children take Level 1. From then on every child must succeed on all "even" levels. Any child who is unsuccesful on an "even" level is placed at the succeeding "odd" level and given instruction to

FIGURE II

CORRELATION BETWEEN GRADES AND LEVELS IN READING


Kindergarten
Ginn Basic Readers
Junior Pr. B..... Readiness) Games To Play &
Junior Pr. A..... Readiness) Others
Level One..... Basic Readiness Book- Fun with Tom& Betty
Level Two.....Pre-Primer,The Red-Green-Blue Story Books
Level Three.....Guess Who or Equivalent-Come With Us
Level Four.....Primer- The Little White House
Level Five.....Supp. Primer- Under the Apple Tree
Level Six.....Book 1-- On Cherry Street
Level Seven.....Supp. Book 1-- Open the Gate
GR.I
Level Eight.....Book II1-- We Are Neighbors
Level Nine.....Supp. Book II1
GR. II
Level Ten.....Book II2-- Around the Corner
Level Eleven.....Supp. Book II2-- Ranches & Rainbows
Level Twelve.....Book III1-- Finding New Neighbors
Level Thirteen.....Supp. Book III1
GR. III
Level Fourteen....Book III2-- Friends Far & Near
Level Fifteen....Fun & Fancy
Level Sixteen.....Book IV-- Roads to Everywhere
GR.IV
Level Seventeen..Supplementary Book IV
Level Eighteen..Book V-- Trails to Treasure
GR.V
Level Nineteen.Supplementary Book V
GR.VI
Level Twenty..Book VI-- Wings to Adventure

(From M. Carlson and H. Roche, The Van Dyke Level System, Warren Public Schools, Warren, Michigan, p.3).

meet his specific needs. The two stages between Kindergarten and Level 1 are for those children who exhibit functional visual or auditory inadequacies. The period of time spent in these Junior Primary Stages could range from a few weeks to a year or more depending on the child's needs.

Where achievement levels in other subjects in addition to reading are taken into account the typical classification pattern is like one used in the Windsor Public Schools:

Grade I	—	Levels 1-2-3
II	—	Levels 4-5-6
III	—	Levels 7-8-9
IV	—	Levels 10-11-12
V	—	Levels 13-14-15
VI	—	Levels 16-17-18

In the Windsor plan each level is based on three skill subjects—reading, arithmetic, and spelling. Pupils are divided into superior, average, and slow groups, and each group is supposed to travel at a pace which challenges without frustrating. Each year the superior group is likely to complete four levels, the average group three levels, and the slow group two levels or less.

The rather narrow basis of classification employed in these so-called nongraded plans seems to attach greater importance to reading than any other aspect of the curriculum. It might be argued, however, that the school has a larger responsibility than simply to teach children how to read, and that growth in other skills, understandings, and attitudes also deserves similar attention. Often the classification is in terms of specific reading comprehension and vocabulary skills. While these two skills are essential elements in the complex process which is called reading, they are not in and of themselves reading. When the actual basis for classification is this narrow, it may lead to an overemphasis in instruction upon the development of the specific comprehension and vocabulary skills which govern pupil progress and a neglect of other aspects of reading instruction. At the same time, the other subjects of the curriculum may also be slighted.

These objections appear to be overcome to some extent in those programs which endeavor to take into account achievement in other areas such as arithmetic and spelling, as well as social-personal development factors, in their classificaton schemes. Nonetheless, it would appear that the methods of pupil classification presently used require further modification and refinement in order to provide more effectively for the inter-individual and extra-individual differences among elementary school children, and to give appropriate emphasis to all aspects of the curriculum.

It would appear also that there is still a great tendency to think in terms of grades when establishing the levels, or steps, in a nongraded program. In many instances it was observed that the traditional grades were simply subdivided into smaller units. As a result, there may be a tendency for school workers to equate a number of these units with a grade and treat them accordingly. If this should occur then the longitudinal view of a child's development underlying the concept of continuous progress may be lost. And instead of a nongraded program one may have only a more complex version of the graded system.

Pupil Selection

Basic to the successful operation of a nongraded program is the careful analysis of each child's performance and development in an effort to secure data and establish criteria to aid in pupil selection and assignment to the appropriate level of instruction. The factors commonly taken into account are intelligence, chronological age, reading readiness, primary reading skills, health, social-personal development, and home environment. Standardized tests and teacher judgments are relied upon to furnish evidence relative to most of these factors.

Illustrative of the selection procedure followed in many nongraded programs is the plan followed by the Hamilton Public Schools. In this school system pupil selection begins with Readiness tests administered in kindergarten. In the first year of formal schooling standardized primary tests are given early in the term. In succeeding years formal reading tests (Dominion, Gates) and vocabulary tests (Gates, Iowa, Schonell) are utilized. Arithmetic and spelling tests are also given. In addition, information concerning the age, rate of learning, work habits, record of past performance, health, and home environment of each pupil is carefully analyzed for the purpose of establishing his instructional level.

Typically, intelligence is measured by tests with a rather high verbal loading. As a consequence, what is measured may be a child's experience rather than his basic intelligence or potential. To offset this possibility, and to increase the validity of the assessment of intelligence, it would appear desirable also to employ the score obtained on a non-verbal type of intelligence test. Similarly, it may be that the achievement tests used yield information about only one or two aspects of knowledge or skill in a given subject. Thus, more than one standardized test of achievement may need to be used to give a fair picture of a child's total proficiency in any given area.

Heavy reliance is placed upon teacher judgment in assessing a pupil's social-personal development. Human behavior and values are not easily judged. If these kinds of judgment are to be a valid

base upon which to build selection procedures, it would seem imperative that the persons making these judgments be professionally competent in this area. Obviously such competence is not to be found amongst all elementary teachers. Thus more careful guidance to the teacher in assessing social-personal development than was observed in the nongraded programs examined, appears to be needed. This might be accomplished through the development of checklists, the provision of consultative help, and the use of auxiliary services.

Many nongraded systems stress the importance of an observational year in which to secure and assess pertinent data before assigning a pupil to a particular achievement or instructional group. The introduction of a kindergarten year appears to be a most effective device to accomplish this. Also emphasized is the need for continuing assessment to provide for possible reclassification whenever this is appropriate.

Pupil Grouping

There appears to be no common basis for grouping pupils in nongraded programs. Nine American and two Canadian school systems reported using reading achievement as the basis for grouping. Eight systems grouped according to chronological age, while another six employed a social maturity index for this purpose. Grouping by mental ability was the practice in four other systems, and three plans took a multi-factor approach to grouping. The variety and narrowness of these grouping procedures appears to reflect the lack of reliabile research evidence on this matter.

Similar variation exists with respect to the actual grouping of pupils by rooms for instructional purposes. Some systems segregate superior, average, and slow learners, while other deliberately assign pupils representing two or more achievement levels to each room. Most of the Canadian school systems surveyed favor this latter arrangement. It is contended that such an arrangement avoids the dangers of segregation and provides for some "sparkle" in each classroom. In addition, with two or more groups labelled as different in her classroom the teacher tends to be forced away from total class teaching toward individualized instruction. In whatever way pupils are assigned to classrooms, teacher acceptance and support of the plan appears to be essential. For when this is lacking the successful operation of the program is often impeded.

Curriculum

Although reading tends to be the core of the curriculum in most nongraded programs, the overall content of the curriculum does not appear to differ materially from that of the traditional graded

program. The main difference seems to be in the way the content is organized to fit the various achievement levels which are established. In many instances the content of the former curriculum was merely divided into convenient sections to correspond to a level or unit of instruction. Such a re-packaging of content assumes that it was not the content of the graded program which was inappropriate but rather when and how it was taught. It also assumes that all children should learn the same thing, but at different rates. It may well be that, since children differ so widely in abilities, needs, and interests, there should be some consideration given to providing different content for different groups of pupils. If this does not seem feasible or appropriate, then some measure of difference in teaching methods and materials would seem to merit serious attention.

Related to this latter point, is the reported reluctance of some teachers to change their established practices and to utilize new methods and materials. A comprehensive inservice training program would appear to be one method of overcoming this difficulty. Another curricular problem in non-graded programs is that of continuity and sequence. As pupils shift from one group or level to another there is no guarantee that learning will be continuous. The continuing teacher plan, or a system of teacher cycling, appears to offer the best solution to the problem at this time.

An encouraging development, particularly in Canadian programs, is the extension of the nongraded curriculum to embrace other skill subjects in addition to reading. It would seem only logical to assume that future nongraded programs will embrace a larger portion of the total curriculum than is presently the case.

Pupil Evaluation

Three salient features about pupil evaluation in nongraded programs were observed. First, evaluation is usually based on an individual standard. Second, a multi-factor approach to evaluation is often followed. Third, evaluation as a continuous process receives considerable emphasis.

The use of an individual standard seems to have the advantage of evaluating a child in terms of his own capabilities rather than on a group basis. In this way a child is not penalized for not achieving what he is incapable of achieving. This, in turn, could conceivably result in improved motivation, especially for the slow learner, and a renewed effort on the part of the superior child. At the same time, however, the use of an individual standard gives rise to certain problems. One of these would appear to be that a false impression could be obtained of a child's ability based on his effort in school. If he is progressing at his maximum capacity at all

times, as is suggested by the philosophy of the nongraded program, it is somewhat difficult to distinguish the slow learner from the superior child; whereas evaluation based on a group standard tends to make the differential much more apparent. Thus it is conceivable that parents, particularly those of slow learners, may get a false impression of their child's ability.

The broad multi-factor approach to evaluation employed in some nongraded programs appears to be more defensible than the single-factor, usually reading achievement, approach in others. Obviously, a comprehensive and well-balanced nongraded program has to be concerned with all aspects of a pupil's growth, not just his achievement in one area, not matter how important this one area might be at a particular stage in his development. This concern with all facets of a pupil's development must also be reflected in the evaluation procedures which are used.

The emphasis upon continuous evaluation in nongraded programs is to be expected. Since it is in itself a continuous process, it would seem only natural that pupil evaluation be continuous also in order that the pupil's individual learning needs may be adequately met at every stage of his elementary school career. For if evaluation were sporadic, rather than continuous, the diagnosis of learning difficulties and the assessment of readiness for new learnings leading to eventual reclassification of a pupil for instructional purposes at various times throughout the school year would be seriously impeded.

Reporting

Two types of reporting procedures are commonly used in nongraded programs—the parent-teacher conference and the report card. A trend toward more use of parent-teacher conferences was revealed. Encouragement of this trend seems most desirable. Close understanding and cooperation between the home and the school was repeatedly emphasized as essential to the success of a nongraded program. Parent-teacher conferences afford an excellent means of fostering such understanding and cooperation.

The report cards used in nongraded programs are typically modified versions of those previously employed in the graded program which preceded them. The most noticeable change is in the type of marking system used. There is a definite trend toward the use of graphs, checklists, or numbers based upon a satisfactory-unsatisfactory dichotomy in place of percentage marks or symbolic letter grades. While these changes in the marking system may minimize comparisons and discourage competitive marking, they may be less meaningful to pupils and their parents. To overcome this lack of understanding of marking system modifications, close

communication between the home, the school, and the child must be maintained. This need appears to further emphasize the desirability and importance of a least supplementing report cards with parent-teacher conferences.

Promotion Practices

Promotion practices in a nongraded plan are based on a philosophy of continuous progress. Hence, many of the problems associated with nonpromotion and skipping are largely overcome. It was observed that some systems promote at irregular intervals while others place certain restrictions upon the amount of progress which a pupil can make in any given school year.

The major problem in this area appears to be related to the selection of the appropriate time to promote or move a pupil to the next higher level of instruction. Should pupils move from one instructional group to another at the end of each level, or upon the completion of a series of levels? There seems to be little evidence upon which to base such decisions. Similarly, there appears to be little evidence to justify basing promotions primarily upon a single criterion such as social maturity or chronological age as was the case in some of the nongraded programs surveyed. Thus, it would seem to be indicated that the timing and bases for promotional decisions in nongraded programs need to be further explored.

Administrative Records

As was noted earlier, the nongraded program is primarily an administrative device designed to facilitate continuous pupil progress. It was not surprising, therefore, to find that administrative records have an important function in such a program. A number of record forms, beyond those generally found in a school, have been developed to facilitate the effective evaluation and regulation of continuous pupil progress.

With any system of schooling, administrative records are time-consuming. Obviously, the introduction of a nongraded system does nothing to lighten this phase of school operation. In fact, it appears to increase the amount of record-keeping required of both teachers and administrators. One desirable development in nongraded programs might, therefore, be the provision of adequate clerical assistance, and the establishment of certain standardized record-keeping procedures in order to enhance the smooth functioning of the program.

Recommendations

The findings of this study give rise to the following recommendations concerning the development and improvement of nongraded elementary school programs:

1. That a comparative study of pupil achievement and social-personal development in nongraded and graded programs be undertaken in an effort to assess the relative strengths and weakness of nongraded programs.
2. That existing selection and classification policies and practices be re-examined with a view to clarifying the bases for selection and classification decisions and insuring the most effective placement for each child.
3. That the scope of nongrade programs be broadened in an effort to provide for continuous progress in all aspects of a child's development.
4. That attention be given to the development of differentiated curricula, and special methods and materials designed to facilitate individualized instruction so that the educational needs of all children may be more effectively met.
5. That school workers responsible for the pre-service and in-service education of teachers develop programs to help teachers better assess and meet the individualized instructional needs of their pupils with a view to enriching the educational experience of each child.
8. That current promotion policies and practices be further analyzed with a view to clarifying the bases and timing of promotional or re-classification decisions.
9. That experimentation with various methods of pupil grouping be undertaken in an effort to ascertain their relative merits, thereby improving the grouping procedures presently employed.
10. That consideration be given to the establishment of a kindergarten observational year in order to facilitate the careful selection and classification of pupils for a nongraded program.
11. That an attempt be made to minimize and standardize the record-keeping required of teachers so that they may devote an increasing proportion of their time and energy to instructional tasks.
12. That an experimental nongraded program be introduced in selected junior high schools with a view to assessing its desirability at this level.

REFERENCES

1. Ritchie, R. C. "A Survey of Selected Nongraded Elementary School Programs in Canada and the United States." Unpublished Master's thesis, University of Alberta, 1960.

A CANADIAN CRITIC ON TEACHER EDUCATION IN WESTERN U.S.A.

By

Charles C. Anderson

University of Alberta
Edmonton, Canada

Systems of value, which largely determine educational theory, objectives, and curricula, are some of the most obvious causal links between a culture and its schools. American values, whether they be "sacred" (beliefs in democracy, equality, human perfectability, and the like) or "secular" and of Spindler's 'traditional" or "emergent" type, contain no reference to the intellect; intellectual operations and standards are not cherished as part of what Kluckhohn terms "the desirable," which influences the selection of the means and ends of action. The relative absence of reference to the intellect is one of the most immediate impressions received by a Canadian professor visiting schools of education in the American west for the first time.

For example, it was the consensus of informed opinion—and I saw little that would enable me to controvert this—that schools of education provide an intellectual training less adequate than that of any other university department. Research there was less frequent and august than in the many psychology departments I visited; indeed, only Gilbert at Berkley, Kersh at Oregon, Keislar at Los Angeles, and Sheldon at Colorado State had on hand an appreciable body of research, and even this could scarcely compare with Guilford's recent researches in the University of Southern California, Mackinnon's on creativity at Berkeley, or Horst's on differential grade prediction at Washington. Again mandarins of international repute like Hilgard at Stanford or Krech at Berkeley or Leeper at Oregon do not exist in professional western education. Further, I gained the impression that a surprising number of courses in many institutions were very much depleted of intellectual content. Guidance, for example, struck me as a hybrid melange of watered-down child psychology, mental health, tests and measurements, and non-practical clinical psychology. The subject never struck me as having any academic significance and its existence presupposed that the teacher was a fool. The less distinguished the institution, the greater was the proliferation of its courses in guidance. Often instructors in education would explain the dilution as a product of the poor quality

Reprinted from School and Society, April 23, 1960, Vol. 88, No. 2171, Pages 204-207.

of the student in education. Why, said one, should high standards be maintained in a course in psychometrics when none of the class, which is made up mainly of administrators, will use statistics? Because, I told him, it is part of their intellectual and cultural training. Coming to think in terms of probability and hypothesis testing is a characteristic of any educated man in contemporary life. He was not noticeably convinced.

Similarly, schools of education have developed a proliferation of courses with little practical, and neither intellectual nor cultural, justification: Principles of Education, Introduction to Teaching Procedures, Directed Teaching, Professional Laboratory Experiences, Principles of Safety Education, Field Training in Health Education, Co-ordination of Distributive Education and Diversified Occupational Program, College Problems, and Problems in Modern Methods. Another educational parallel of the disinterest in ideas apart from their commercial value is the sudden appearance of university courses in school administration which are almost exclusively of the technician how-to-do type (one exception is Colorada State College which is concentrating on a systematic approach to the theory of administration). There may be some practical merit in these courses—this never has been established—but they would fit more suitably into an intensive summer short course dissociated conpletely from the universtiy, its academic rewards, and disciplines. School administrators are being trained not as intellectuals, independent, mindful of the value of truth, dignified in dealing with people, and critical of authority, particularly their one, but as hirable technicians. Perhaps universities ought to train school administrators; if so, the current method is not the way to do it.

Courses in schools of education tend to be judged more by their practical than by their cultural value. Utility is always a dangerous criterion of the value of a course when that same utility never has been experimentally justified, a fact which leaves the way open for the following counter-assertion made in the *Atlantic Monthly* by a professor of a state college in Washington: "There is no available evidence that courses in educational philosophy, educational psychology, or similar ones will help to produce teachers."

While this may possibly be the case, it ought not to detract greatly from the value of education courses which can justifiably claim affinity with the larger academic disciplines: history, psycholoy, sociology, and philosophy. As any parent knows, educating a child raises the most testing ethical problems that would exercise a skilled philosopher; the understanding of children would tax the most avid developmental psychologist or personality theorist, and even ostensibly practical courses have wider social implications.

For example, it is thoroughly unsatisfactory to mention Thorndike without mentioning Darwin and "social Darwinism," to handle tests and measurement without mentioning Plato, Max Weber, and Karl Marx, or to teach developmental psychology without referring to "Amanda Vail," Alex Karmel, Neville Algren, Christopher Davis, and Colette. (The fact that the standard texts do not do so is no excuse.) Nowadays, the prizes in the form of intellectual rewards go to those who are not afraid to cross frontiers, and there are certainly no prizes today for those in professional education who confine their teaching to everyday hints about classroom maneuvers.

Certainly, there is a current interest in the gifted child but some of it is merely lip-service. At one institution, some of the gifted freshmen were labelled "h" or "honor" students. Nobody, least of all the administrative heads of that institution, had the remotest idea what to do with them. Were these students, I asked, to receive an "enriched" program or extra courses? Certainly not. Why, then, give them the accolade of "h" at all? No very convincing or coherent reply. A skeptical young instructor pointed out to me that, if the local politicians came 'round, the presence of the "h" would indicate that this particular institution was not lagging behind in the case of the gifted child—the contemporary "hot" theme in education.

Another illustration of anti-intellectualism is the widespread administration of home-made or standardized rating scales for measuring the quality of instruction in the university. One very mature professor of education pointed out this fact, bewilderingly novel to me, with a certain amount of pride. When in the University of Washington, I discovered that there was an Office of Student Ratings directly responsible to the administrative head of the university. Its director, a very competent young man, gave me a booklet on college teacher evaluation by the distinguished psychologist, E. R. Guthrie, which states:

> Nine students out of ten entering college do not bring with them any channelled academic interest. They are for the most part active, healthy young people who will go from college into a wide variety of non-professional occupations. If there is any point in having citizens who have a good general education, who have enough knowledge of the world outside our boundaries to vote intelligently on foreign policy issues, or if there is any point in having citizens who can take informed stands on the issues on public health, education and public spending, which are in our republic ultimately decided by public opinion and majority vote, then there is some point in emphasizing the value of effective teaching. Students do not enter college with a thirst for these virtues or for the knowledge and skills that make middle age and old age interesting. Hot rodders and drum majorettes do not become scientists or philosophers, but they do enter college and do become voting citizens.

There are three points worthy of critical attention. First, good

university teaching can somehow convert the hot-rodder or drum majorette into a citizen who can take an "informed stand" on public issues. It would be pleasant to discover any experimental evidence of such a desirable outcome. Such a sea change is possible in the case of a few superior students but quite impossible for the generality who possess no motive for academic achievement.

Second, Guthrie's assertion that symbolic knowledge and skills are largely a compensation and comfort for the relatively elderly is contradicted by our knowledge of the development of intelligence. Other things being equal, youth is the time for easiest and best retention. And the best of this toil, the learning which will change the individual's attitude and values, stems from the discoveries he makes while reading alone, often to supplement the inadequate lectures just received. Certainly, it is most desirable to have scholarship combined with teaching proficiency, but if a choice is to be made, then a fair case can be made for choosing the former. The university instructor is a repository and guardian of knowledge, not a hot gospeler or academic salesman.

Finally, Guthrie assumes that university education is almost a right, not a privilege, and that a large percentage of the school population has sufficient scholastic potential to make significant headway at the university level. This is a dangerous assumption. According to a recent California estimate (Research Report No. 219, Los Angeles School Districts), 30% of any one age-group starting out in the elementary school is attending an institution of higher learning. Even at this relatively generous contemporary figure (in Britain the most favorable similar estimate of the "pool of ability" is 15% and the most realistic estimate based on statistical facts is 11%), sizeable numbers of freshmen are in scholastic trouble. For example, in one large western university, 19% of the freshmen were assigned to a corrective English course and only 37% were considered eligible to take any course in mathematics more difficult than beginning algebra. Only 37% of the students who had taken at least two years of modern foreign languages in high school were able to continue these studies at a level thought to be commensurate with their indicated background. Even in one large private university of considerable academic standing, the administrative head of the counseling center admitted that reading difficulties and ignorance of how to study were the main problems of the students being interviewed.

Why were these students ever admitted in the first place? A few instructors hinted darkly to me that practically any grade 12 student could force his way into a state university or college. If this is the case, and especially when confronted with statistics such

as the above, why do schools of education not lead an attack against the view that there is a practically unrestricted pool of ability available for university studies? If the professional educator fails to do this, then the offensive will be taken by one of his academic colleagues in another department who will label him and his tribe with the current stereotype of anti-intellectualism. However erroneous this stereotype may be, it nevertheless animates much of the current criticism of the professional educator in America by his academic colleagues. For example, I encountered Paul J. Hoffman at the University of Oregon who was pessimistic about current American educational practices and decisions and who offered as proof a simple paper he had written on textbook vocabulary in introductory psychology. He had given a class of 37 students a vocabulary test consisting of a list of 53 non-technical words from a textbook in introductory psychology.[1] Scoring was liberal and yet only one students got more than 39 of the 53 words correct: half of the students were unable to identify correctly 40% or more of the words; and 19% missed 32 or more. The word "synonym" was incomprehensible to 25% of the students and practically no one could understand "germinal", "rapprochement", "impasse", or "disparage". Hoffman asks, in conclusion:

> . . . will the institution follow a policy of enriching its curriculum for those capable of profiting from it, or will it simplify and readjust the curriculum to the slow learner and the mass audience? Contemporary colleges and universities might incline toward the former alternative were it not for two factors: (a) it is not considered democratic, and (b) it will result in decreased enrolment. The net result is an extreme reluctance to be selective in admissions policy beyond requiring high school graduation; with administrators convincing themselves, through some sort of whimsical rationalisation, that remedial programs, bonehead English, and psychology of adjustment will remove a student's difficulties. . . . With regard to decreased enrollment, it is conceded that the number of individuals obtaining degrees would be reduced as a result of more careful selection procedures, but it appears obvious that the number receiving an **education** would increase substantially.

How worse will the situation be when university enrollment increases not merely as a result of the increased birthrate, but also as a result of the determination of proprotionately more students to go, irrespective of ability, to a university? It is here and now that the professional educator should make his voice felt in support of the fact that a university, unless it takes on the functions of the high school, can provide adequate training for only the small section of the community which can benefit by that training. I realize that this is a very difficult task because the doctrine of human perfectibility and plasticity is one of the fundamental "sacred" American values. However, the doctrine is beginning now to have serious im-

[1] P. J. Hoffman, **Psychological Reports, 4: 229-230, 1958.**

plications, if only because, as Vance Packard recently has discovered, there is a trend toward using the university diploma as a major discriminant of social class.

However, the task is not impossible and professional philosophers like Sidney Hook recently have risen to it. There is no reason why professional educators, especially the younger ones, should lag behind. It is too much to expect the "power élite" of the older generation to do much about it now; they lack that bright and brisk skepticism which is trained to appreciate the discrepancy between the observed and the ideal, no matter whether the latter takes the form of the local tribal mores or the local educational nostrums. Bell,[2] for example, makes this point when he argues generally against Lippset that the intellectual must be capable of alienating himself from the values of his society.

> Alienation is a constituent element of a viable culture, and when allowed to exist freely as an attitude it proves the vigor of the culture. An attitude of alienation is one of criticism and skepticism, of acknowledging a relationship while being detached. It is one of the necessary safeguards for intellectuals, as a permanent posture, lest they become committed to the winds of ideologies and blow hot and cold with them. The attenuation of the power of ideology, I believe, is one of the positive signs of sanity of the intellectual. But his strength also depends upon his willingness to refrain from being an ideologue—his willingness to be, in that sense, alienated.

The beginnings of such skepticism, of such an alienation, can be seen among the younger professional educators who view with distaste the petty trivia often comprising courses in school administration, guidance, and the poorer type of textbook methodology, and who are turning for inspiration to the link between education and authentic disciplines such as psychology, sociology, and philosophy. They look with critical, even jaundiced, intent; they decline to accept dogmas without evidence; and for them the established mandarins in education are potentially targets of ridicule, not objects of awe. This trend coupled with an increase in the quality of education students, will herald the day when the study of education will be at least as cultural as it is practical and when, accordingly, the school of education will no longer bring up the rear of the academic procession.

---

[2]D. Bell, **Daedalus**, Summer, 1959, 495-498.